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# China

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## Agricultural and Trade Report

Situation and Outlook Series



**Increasing  
Open Markets**

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## Summary

China's 1991 grain output fell to 435 million tons, down 2.5 percent from the record 446 million tons in 1990. Area sown to grain decreased 0.1 percent to 112.3 million hectares. Yields fell by 1.5 percent because heavy summer rains offset increased input use. Rice output fell 2.9 percent to 184 million tons, wheat dropped slightly to 96 million tons, and corn rose 2 percent to a record 99 million tons.

Total grain output in 1992 is projected to decline to 430 million tons because of lower planted acreage. China's target is 435 million tons. Consecutive good grain harvests in 1990 and 1991 boosted domestic corn supplies, resulting in no corn imports in 1990/91 and none projected for 1991/92 and 1992/93. Corn exports for 1991/92 are projected to reach 8 million tons and remain near this level for 1992/93. Despite excellent domestic wheat crops, low international prices, population growth, and rising incomes have continued to support large imports. They reached 15.5 million tons in 1991/92 but are forecast to fall to 14 million tons for 1992/93. China's 1991/92 rice imports and exports are forecast at 100,000 and 750,000 tons, respectively.

Total oilseed crop production in 1991 increased 3 percent over 1990 to 34.2 million tons. Good crops in 1990 and 1991 reversed the trend of declining oilseed output since 1985's record crop. Increases in cottonseed and rapeseed output offset decreases for soybean, peanut, and sunflowerseed. Cottonseed production increased 26 percent to 9.7 million tons. Rapeseed output increased 7 percent to 7.4 million tons, in spite of flooding in the lower Yangzi River Delta. Total oilseed crop area for 1992 will rise slightly because of expected soybean area increases. Total oilseed output is projected to rise in 1992.

Cotton output for 1991 rose 26 percent to 5.7 million tons. Area was up 17 percent to approximately 6.5 million hectares because high state procurement prices made cotton a profitable crop and because farmers switched to cotton after heavy spring rains limited prospects for competing crops. According to a survey of planting intentions published in China's press, 1992 cotton acreage is expected to be about the same as last year. Cotton production in 1992 is forecast to fall to 5.6 million tons.

Meat output was a record 31.4 million tons in 1991, 10 percent above the previous year and surpassing the 1995 official planned target of 30 million tons. Pork output rose 1.7 million tons to 24.5 million, while poultry meat production expanded 22 percent to 4 million tons. Excellent grain and oilseed crops in 1991, particularly the record corn harvest, will maintain feed supplies and promote continued growth in meat output in 1992.

Trade between the United States and China rose from \$20 billion in calendar 1990 to \$25.2 billion in 1991. Total U.S. exports to China in 1991 rose 31 percent to \$6.3 billion, while imports from China rose 24 percent to \$18.9 billion, leaving the U.S. with a merchandise trade deficit of \$12.6 billion. The value of U.S. agricultural exports fell from \$814 million in 1990 to \$722 million in 1991, primarily because of a fall in the unit price for U.S. wheat. The value of U.S. agricultural imports from China increased from \$270 million in 1990 to \$328 million

in 1991. U.S. agricultural exports to China in fiscal year 1991 totaled \$668 million, but are expected to increase 8.8 percent to \$727 million for 1992.

China's 1991 gross national product reached 1.96 trillion yuan (\$368 billion), a real increase of 7 percent from 1990. The gross value of agricultural output grew 3 percent in constant value terms in 1991.

General retail prices rose less than 3 percent in 1990 and 1991 compared with a 1989 increase of 17.8 percent. Cost of living rose 5.1 percent for urban residents because of price increases for grains, edible oils, and services. Cost of living for rural residents increased about 2.3 percent.

China's regional trade grew rapidly during the 1980's, particularly with South Korea, Japan, and Taiwan. Hong Kong has a special role as a transshipment point for China's trade. Since 1987, Hong Kong has been China's biggest trade partner. China's agricultural commodity exports are expected to continue in the 1990's.

Based on revised estimates of China's barley production, consumption, and trade, domestic demand for high quality brewing barley exceeds supply and import prospects are good.

Estimates of the impact of income growth and reform of the urban rationing system on China's food consumption patterns in the year 2000 show that domestic feed supplies will not match demand for meat. Therefore, China will either have to import feed stuffs or livestock product to meet the demand.

China's system of agricultural marketing changed dramatically during the 1980's. However, the government still intervenes heavily in the procurement and distribution of grain and oilseeds. For most other commodities, including vegetables, fruits, meats, and aquatic products, open market sales now account for the majority of retail sales. Recent policy changes and the rapid development of open agricultural markets will continue to weaken the role of the government in China's agricultural commodity marketing system.

China's central government is promoting two campaigns in rural areas: the socialist material civilization and the socialist civilization movement. The first aims to boost rural output by improving the land contract system, providing more inputs and additional services for farmers, and investing more resources in rural areas. The second more political campaign is designed to strengthen socialist institutions and values in rural citizens by improving education programs, building party branches, and developing economic cooperatives.

In the 1980's, China's rural labor force grew 2.6 percent a year while population growth was limited to 1.5 percent. Rural underemployment continues to be a widespread problem with surplus laborers estimated to number in the tens of millions. The creation of rural nonagricultural jobs remains a key solution to this problem.

# Macroeconomy

## GNP Growth Rate Up in 1991

China's 1991 gross national product (GNP) reached 1.96 trillion yuan, a real increase of 7 percent from 1990. In contrast, the real rate of GNP increase was 5 percent in 1990 and 3.9 percent in 1989. Growth in 1991 was a near return to the 8-12 percent levels in 1984-88. Although growth was healthy, 1991 was still characterized by halting restructuring of the debt-ridden state industrial sector, continued low levels of economic efficiency, serious government fiscal arrears, and a rapidly expanding money supply (table 1). Positive developments in 1991 included healthy growth in agricultural output, a rebound in retail sales, a reduction in commercial enterprise stockpiles, and, despite decontrolling or raising a number of important retail prices, only relatively modest increases in the retail price level and general cost of living.

**Table 1--Yearend macroeconomic indicators, 1990-91**

Indicator	Units	1990	1991
Population	Million	1,143.3	1,158.2
GNP growth <sup>1</sup>	Percent	5.0	7.0
Total loans <sup>2</sup>	Bil. yuan	1,516.6	1,804.4
Total deposits <sup>2</sup>	"	1,164.5	1,486.4
Currency in circulation	"	264.4	317.8
Total state revenues	"	331.3	358.3
Total state expenditures	"	345.2	379.4
State budget deficit	"	14.0	21.1
Fixed asset investment <sup>3</sup>	"	445.1	527.9

<sup>1</sup> GNP growth in constant value terms. <sup>2</sup> Yearend balance. <sup>3</sup> All sources.

Sources: 1991 Statistical Communique and 1992 Statistics Abstract.

Although China's official budget deficit for 1991 was reported to be 21.1 billion yuan, reconciling China's revenues and expenditures to standard Western accounting procedures (for instance, excluding domestic and foreign public debt from revenue, including repayments on these debts in expenditure, and treating enterprise-loss subsidies as an expenditure rather than a revenue offset) reveals a very different picture. China's true 1991 central budget deficit may be at least 65 billion yuan, more than three times the official figure (8). However, compared with the majority of other developing economies, even this higher deficit figure is still relatively low at 3.3 percent of GNP. The main worry is that the deficit has stubbornly resisted all government attempts to bring it under control.

The central government still finds it difficult to collect tax revenues from collective and individual enterprises. Loss-generating state enterprises and the urban food subsidy system also drain the central budget. These problems require fundamental price, subsidy, bankruptcy, and labor reforms.

Responding to these problems, the government began to raise subsidy grain prices in 1990. In late 1991, sugar rationing was completely eliminated. And over the last several years, state-owned enterprises have come under increased pressure to operate profitably or face closure. Despite these steps towards reducing government outlays, additional reforms are urgently needed.

China's 1991 gross value of industrial output (GVIO), in constant value terms, grew at a rate of 14.2 percent, up from a more moderate 7.6 percent in 1990 and 8.3 percent in 1989, but still far below the 20.8 percent in 1988. Light industry output value in 1991 rose increased 14.5 percent, while heavy industry grew slightly less at 13.9 percent. In 1991, the growth in the value of state-owned enterprise output was far below that of collective, individual, or foreign-owned operations (table 2). In 1991, state and collective industrial output as a share of total industrial output was 53 percent, down from 55 percent in 1990 (12).

Although the output value of the overall state industrial sector grew in 1991, large numbers of state enterprises remain plagued by over-staffing, low productivity rates, poor or inconsistent output quality, large inter-enterprise debts, cost overruns, losses created by decontrolled input prices but controlled ex-factory prices, and finally, huge stockpiles of unsold inventory. All of these problems contributed to a 14.2 percent decline in state enterprise profits (13). Many of China's state enterprises absorbed large amounts of government credit and produced a higher level of output in 1991, but remained unprofitable because of inefficient operation and the poor quality of goods produced.

The gross value of 1991 agricultural output (GVAO) grew 3 percent from 1990 in constant value terms. This was less than the 1990 growth of 6.9 percent, but about the same as 1988 and 1989. Total grain production reached 435.3 million tons, a decline of 2.5 percent from 1990. However, production of cotton, oilseeds, sugar crops, flue cured tobacco, tea, and fruit all rose above 1990 levels. Measured in constant value terms, crop, forestry, animal husbandry, sideline product, and aquatic output growth improved over 1990, though the rates of growth for crops and sideline products were down (table 2).

The rural economy as a whole, including both the agricultural and non-agricultural sectors, continued to expand in 1991, increasing 11 percent from the previous year. The total output value of the nonagricultural sector as a share of total rural output also rose, reaching 57.7 percent, up from 53.9 percent in 1990. The output value of the rural non-agricultural sector has risen dramatically since reforms were introduced in 1979.

## Retail and Commercial Situation

After last year's retail sales growth of 1.9 percent, 1991 posted a 13.2 percent increase (10 percent after adjusting for inflation). The value of total rural market sales rose by 10.4 percent, while urban market sales rose by 16.1 percent, at least in part because of the price increase for urban grain and oil rations. However, sales to institutions increased faster (18.6 percent) than either retail sales to consumers (13.5 percent) or sales of agricultural production goods to peasants (11.5 percent).

**Table 2--Industrial and agricultural output value, 1989-91<sup>1</sup>**

Sector	Units	1989	1990	1991
Total industry	Bil. yuan	2,202	2,392	2,823
State sector	% change	3.7	2.9	8.4
Collective sector	"	10.7	9.1	18.0
Private sector	"	24.1	21.6	24.0
Total agriculture	Bil. yuan	654	766	816
Crops	% change	2.1	8.3	0.9
Forestry	"	0.9	2.2	7.8
Animal husbandry	"	5.5	5.9	6.1
Sideline products	"	5.8	3.4	1.8
Aquatic	"	8.0	6.7	6.7

<sup>1</sup> Total industry and agriculture values are calculated on the basis of current prices, while growth rates are calculated on the basis of comparable prices.

Sources: 1989-91 Statistical Communiques; 1992 Statistics Abstract.

Although the huge increase in institutional spending helped to invigorate the economy, a sizeable percentage of those purchases were by state-owned enterprises operating at a loss. In other words, a significant portion of the rise in retail sales was generated by increased government, as opposed to private sector, spending. Rising retail sales levels in 1991 reduced state-owned commercial enterprise losses, though they remain a problem (13). State-owned commercial enterprises continue to fight an uphill battle with controlled resale prices, shoddy goods, poor service, and increased competition from private and collectively-owned retail operations.

In an effort to reduce the subsidy burden on its budget, the government raised prices in late 1991 for a number of state-controlled commodities and services. Prices were raised for crude oil, finished oil products, rolled steel, pig iron, railway freight transport, and grain and edible oil rations for urban residents. The general retail price level for 1991 was only 2.9 percent higher than in 1990 because the government price increases hit late in the year and free market prices fell for a number of key agricultural commodities.

China's cost of living index (including consumer goods and services) rose 3.4 percent. The rise was 5.1 percent for urban residents and 2.3 percent for rural residents. However, the relatively small increase in the urban cost of living for 1991 masks a significantly higher increase for the 35 largest cities. The cost of living in 1991 for these cities rose 8 percent compared with the previous year. Comparing urban prices in December 1991 with December 1990, urban prices for grain rose 35 percent, fuel prices rose 12.3 percent, service prices rose 9.5 percent, and vegetable, aquatic product, tobacco, alcohol, and tea prices rose an average of 4.5 percent (13).

According to China's official customs statistics for 1991 trade, despite faster growth in imports than exports, China maintained a total trade surplus and an agricultural trade surplus for the second year in a row (table 3). These are the only years since

1983 that China has had a surplus in both categories. Total 1991 export value rose 15.9 percent, while imports increased 19.6 percent. The same pattern held for agricultural trade -- agricultural exports increased 8 percent and imports 11 percent. China's total and agricultural trade surpluses were in part the result of continued small currency devaluations as the government tried to align the official and swap market exchange rates (swap markets are government sanctioned foreign exchange markets with a partially floating rate). Import growth was restricted from even higher growth because of close government supervision and restrictions. By expanding into new markets, particularly in Asia and Europe, China was able to maintain export growth in 1991 despite an economic recession in the United States, one of its largest trading partners. The overall trade surplus helped China's total foreign exchange reserves to surge 49 percent to \$42.7 billion.

**Table 3--China's foreign trade indicators, 1989-91<sup>1</sup>**

Item	1989	1990	1991
US \$ billion			
Exports:			
Total	52.54	62.06	71.91
Agriculture	9.70	9.77	10.55
Share (%)	18.4	15.7	14.7
Imports:			
Total	59.14	53.35	63.79
Agriculture	6.71	5.47	6.07
Share (%)	11.3	10.3	9.5
Balance:			
Total <sup>2</sup>	(6.60)	8.71	8.12
Agriculture	2.99	4.30	4.48
Foreign exchange reserves	17.02	28.59	42.67
Avg. exchange rate	3.765	4.783	5.323

<sup>1</sup> Trade data is calendar year and on an f.o.b. basis.

<sup>2</sup> Numbers in parenthesis are negative.

Sources: China's Customs Statistics and IMF Statistics.

## 1992 Macroeconomic Outlook

China's official 5-year plan target (1991-1995) calls for an annual average real GNP growth of 6 percent, though a quick survey of domestic newspaper articles and editorials suggests that the government is prepared to see much higher growth in 1992. In fact, GNP growth during the first 5 months of 1992 is already 11 percent, 4 percent higher than growth during the same period in 1991. However, inflation is rising as well, an annualized rate of 11.7 percent based on the first 4 months of 1992. This is in response to the price increases for a wide range of government-controlled commodities in late 1991. This compares with an annualized rate of 2.8 percent during the same period of 1991. Real GNP growth in 1992 will likely fall between 12 and 15 percent, assuming no major shifts in current government economic and political policies.

Between January and May of 1992, GVIO jumped 17.9 percent over the same period in 1991. However, GVIO growth in May faltered slightly, falling to a rate only 16.7 percent higher than May 1991. Total industrial investment grew at an even faster rate, 38.8 percent over the first 5 months of 1991. A number of analysts and officials in China characterize the current growth as investment rather than demand driven. The majority of these investments are state-supplied credits for renovating state-owned enterprise equipment or to keep factories afloat. This is reportedly increasing the central budget deficit as well as causing a rapid increase in the money supply.

In the first 5 months of 1992, the state-owned heavy industry sector responded positively to the credit infusion -- industrial output value increased 20 percent over the same period in 1991. In contrast, light industry, which is primarily collectively or individually owned and not a recipient of state largesse, rose 15.8 percent in the same period. GVIO growth in 1992 is expected to rise nearly 20 percent, though this hinges on continued government financial support for the ailing state sector and no major restructuring of the labor or bankruptcy laws. GVAO in 1992 will likely increase 3 to 4 percent, based on expectations of another successful grain harvest and continued expansion of economic crop output.

In addition to rapid GNP and GVIO growth during the first 5 months of 1992, China's inflation rate has also begun to rise. The general retail price index grew 5 percent over the same period of 1991. The cost of living in China's 35 largest cities grew by 11 percent, though the rate of increase in May was 1.6 percent over the previous month. The total value of retail sales between January and May of 1992 rose 14.4 percent over the same period in 1991, while real urban incomes grew by 5 percent and rural peasant incomes by 10 percent. The pressure on prices is coming from a number of adjustments in state-controlled prices in late 1991 and mid-1992, particularly sharp increases in fuel prices, railroad freight fees, and urban grain and edible oil ration prices. Additional upward pressure will be generated by the government's planned high levels of capital spending and subsidies for government bureaucracy, military, peasantry, and education sectors. Despite serious fiscal arrears, the planned 1992 government budget forecasts a 12 percent increase in overall spending.

The outlook for 1992 is for continued growth in both agricultural and industrial sectors. However, China's inflation rate will be rising in tandem with higher GNP growth. Fueled by rapid industrial growth and high levels of institutional and enterprise spending, 1992 inflation is expected to rise substantially from 1991 levels, perhaps as high as 8 percent. The inefficient, money-losing state enterprises will continue to be the single biggest economic problem facing government decision-makers in 1992. The burden of the urban subsidy system has been substantially reduced over the last 2 years, and the government will likely continue to reduce its remaining support for urban resident and rural state employee grain and edible oil consumption.

Although consumer demand rose in 1991 and is expected to continue growing in 1992, state-owned commercial operations will continue to face heavy losses because of controlled retail prices and market-driven farm-gate or factory door prices. In

addition, many commercial enterprises still have large amounts of unsold, and in some cases unsalable, inventory. Until most industrial and commercial enterprises are required to operate on a for-profit basis or else face closure, China's industrial sector will continue to be shackled with the problems it now faces: debt-ridden state industrial and commercial enterprises, large inventory stockpiles, mounting government debt, and inefficient use of inputs (both labor and capital). In terms of prices, the government has taken several important steps over the last couple of years towards liberalizing both producer and consumer prices. However, further reforms will be necessary before China's economy can move beyond its current mixed system of plan and market and the concomitant problems that such a hybrid creates.

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## Wither Central Planning in 1992?

The *1991 China Agriculture and Trade Report* (RS-91-3) summarized the basic agricultural features of the eighth 5-year plan. Background material regarding the content, implementation, and results of China's earlier 5-year plans and additional details about the eighth 5-year plan can be found in *the CPE Agriculture Report* (3,4). USDA officials visited provinces, counties, and townships in 1991 and found that authorities in these entities had formulated 5-year plans and annual production plans for 1991. Various ministries are also belatedly formulating their portions of the eighth 5-year plan. For example the Ministry of Agriculture recently released a draft of its plan to promote technological advances in rural enterprises. The Ministry plans to allocate about 28 percent of the funds dedicated to agricultural fixed assets and to improving the technology of rural enterprises, including funds for rural energy, ocean going trawlers, processing aquatic products, manufacture of livestock feed, processing of crop and livestock products, and the production and repair of agricultural machinery.

But at the same time there is a definite decrease in the quantity of resources allocated by central planners as markets solve an ever increasing portion of China's economic problems. This decrease reached the point where some officials believe that the State Planning Commission should be abolished or its mission changed substantially because there is so little central planning work being done now (15). During the eighth 5-year plan (1991-95), perhaps the State Planning Commission will focus its energy on solving macro-economic problems and planning government investments in transportation, communication, ports, and flood control projects.

The national draft plan for 1992 was discussed at the National People's Congress in March 1992. Vice-Premier and Minister in charge of the State Planning Commission, Zou Jiahua, reported at the Congress that the guiding principles for the 1992 plan were to accelerate reforms and increase ties between the domestic and international economy. The plan calls for grain production to reach 435 tons, cotton production 4.75 million tons, edible oilseeds 16.5 million tons, meat 31 million tons, and aquatic products 13.5 million tons. During the spring of 1992, provinces reported on fulfilling their 1991 plan targets and announced key tasks for 1992 (6).

China's economists continue to publish works on central planning. Recently a five volume series *My Views on the Economy*, written by over 100 economists reviewed the past 4 decades of China's economic performance (15). While the focus is on the decade of reform, primary emphasis is on solving current economic problems. Some authors addressed the question of what "a socialist economy with Chinese characteristics" really means (see the special article "Building of A New Socialist Order: Implications for Production, Income and Trade."). Also note that China's economists are publishing their analysis and forecasts for the coming year. For example, see *China in 1992: Analysis and Prediction of the Economic Situation* (2).

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## Agricultural Trade

In 1991, China's agricultural trade (exports and imports) rose to \$16.63 billion, a 9.1 percent increase from the previous year, but only marginally surpassing the 1989 agricultural trade value of \$16.41 billion. The increase was attributed to an 8 percent rise in exports, totaling \$10.55 billion, and an 11 percent rise in imports, amounting to \$6.07 billion. The boost in exports was mainly due to increased sales of cereals and tobacco. The expanded imports came mainly from higher purchases of cocoa beans, wool, and cattle hides. In 1991, U.S. agricultural exports to China declined to \$722 million, a 13 percent decrease from the preceding year. The decline mainly resulted from a drop in the value of wheat sold to China.

### Grain Exports Increased in 1991

In 1991, China's agricultural exports increased in all major categories except vegetable oils and furskins. The value of agricultural exports topped \$10 billion for the first time in China's trade history and the agricultural trade surplus, \$4.48 billion, surpassed the previous record of \$4.38 in 1986. Although the share of agricultural value to China's total export value continued to decline, to 14.7 percent, the agricultural trade surplus still accounted for more than 55 percent of China's total trade surplus in 1991 (table 3).

The 1991 increase in agricultural exports was primarily due to expanded cereal and tobacco sales. China's high grain harvests in 1990 and 1991 rejuvenated China's grain exports, particularly corn and rice, to Asian markets (see the special article, "China's Trade with Neighboring Countries Since the Early 1980's"). According to China's customs statistics, 1991 calendar year corn exports increased nearly 130 percent over the previous year, reaching 7.78 million tons. This, together with rice exports, up more than 110 percent from 1990, generated more than \$1 billion in hard currency for China. The export value of the two commodities contributed two-thirds of China's total cereal

## Natural Economic Territories

During the 1980's, the international political situation changed and new frontiers that had been solidly closed began opening. Reduced tensions between the former USSR and China helped open border trade between China and both Russia and the newly formed republics in Central Asia. China also has begun taking an active role in some regional cooperative efforts. The State Planning Commission recently announced the formation of 10 new economic regions that will help these natural economic territories benefit from natural geographic and economic advantages. China's authorities have allocated funds to build new airports, railroad stations, ports, roads, and communication links which will facilitate the expansion of trade.

The East China Economic Region includes Heilongjiang, Jilin, Liaoning and eastern Inner Mongolia. "The region, which has rich resources and fertile land, will be built into China's largest heavy industrial base and a major agricultural, animal husbandry, and forestry base" (2). Officials hope to cooperate with Russia to facilitate economic growth in the Amur River Basin (Heilong, Wusuli, and Songhua River Basins). In early 1992 officials from China, Russia, the Democratic People's Republic of Korea, Mongolia, Republic of Korea, Japan, and the Asian Development Bank met in Seoul, under the auspices of the United Nations Development Program, to discuss a plan to develop the Tumen River Basin and Delta area. Water for the river comes from China and the Democratic People's Republic of Korea and flows eastward to the Sea of Japan through Russia (1).

The North China-Bo Hai Economic Region includes Beijing, Tianjin, Hebei, and Shandong provinces. The region, "...which has a galaxy of talent and advanced equipment, will...develop knowledge- and technology-intensive industries. Coastal areas in Shandong and Hebei...will be built on a major deep-sea fishing, marine fish farming, and cotton production base" (2).

The Chang Jiang Delta Economic Region includes Shanghai, Jiangsu, and Zhejiang. The region, which has a high population density, "...relatively highly qualified personnel, and developed processing industries, will build hi-tech industrial clusters and develop processing industries characterized by new, advanced technologies. It will thus become China's largest economic core region, a base open to the outside world, and for personnel training and financial, trading, and information centers" (2).

The Southern Coastal Economic Region includes Guangdong, Guangxi, Fujian, and Hainan. "It is most suitable to develop the region into an export base"(2). Tensions between China and Vietnam are reduced, so border trade has begun and the friendship gate, which was closed during the Sino-Vietnamese war, opened on April 1. Both sides have agreed to reopen transport and communication links. This region is developing strong economic ties with Hong Kong, Taiwan, and Vietnam.

The Huang He Middle Reaches Economic Region includes Shanxi, Shaanxi, Henan, and the central and western parts of Inner Mongolia. The region will be built into China's largest comprehensive energy and heavy chemical industrial development region.

The Huang He Upper Reaches Economic Region includes Gansu, Ningxia, and Qinghai. Hydroelectric power stations will be developed in this region. Raw and semifinished materials will be produced here.

The Chang Jiang Middle Reaches Economic Region includes Hunan, Hubei, Jiangxi, and Anhui. "The region will be built into an economic corridor along the Changjiang (Yangzi River) stressing industries which need a large carrying capacity and consume large amounts of water" (2). It will be a major agricultural production region.

The Chang Jiang Upper Reaches Economic Region includes Sichuan, Guizhou, and Yunnan. In this region will be built "...a major industrial base with the stress on heavy chemical industry which consumes large amounts of energy" (2). Agricultural and forestry production bases will be built here. As mentioned above, the easing of tensions between China and Vietnam enabled Yunnan province officials to visit their counterparts in Vietnam to promote trade and economic cooperation (3).

The Xinjiang Economic Development Region includes only the province of Xinjiang. Authorities plan to build a major petroleum and petro-chemical industrial base in this region. Agriculture and agricultural product processing will also be developed. Xinjiang officials have opened up two new border trade ports to facilitate trade and economic cooperation with the newly formed Republic of Kazakhstan. The province will use investment funds to upgrade transportation and telecommunication links with its neighbors. The second Eurasia continental rail line passes through Xinjiang and will link the local economy not only with the rest of China but with Europe as well. The rail line is scheduled to open in fall 1992 and will link the east China port city of *Lian Yun Gang* in Jiangsu province with Rotterdam, Netherlands.

The Tibet Special Economic Region includes only the province of Tibet. The economy will be developed slowly because of its isolated geographical position (2). In 1992 about one-third of Tibet's border counties will be permitted to engage in barter trade with Nepal. Officials plan to set up an export processing zone and bonded warehouses to encourage cooperation with Nepal.

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export value in 1991. The balance of cereal exports came from soybeans and dried pulses.

The 1991 exports of tobacco, mostly flue-cured, were up by 122 percent and reached a record 61,000 tons. Total tobacco export value increased almost 140 percent and amounted to over \$118 million. Cigarette exports also increased substantially (see "Tobacco" in the commodity section for more information).

## Agricultural Imports Resumed

China's 1991 agricultural imports were \$6.07 billion, an increase of 11 percent over the previous year, but still 9.4 percent below the 1989 agricultural export value of \$6.71 billion. Major commodities imported to China included wool, cattle hides, cocoa beans, and non-alcoholic beverages, which rose 140, 68, 193, and 48 percent, respectively, over the previous year. In 1991, the value of these imports, together with smaller increases in other agricultural categories, more than offset the value of decreased vegetable oil and wheat imports.

Vegetable oil imports fell 45 percent to \$289 million in 1991 because of a substantial tariff increase that year which ranged from 50 percent for palm oil to 230 percent for soybean oil, and because of higher oilseed crop output in 1990 and 1991. According to China's Customs Administration, wheat imports totaled 12.4 million tons in calendar year 1991, down slightly from the year before. However, lower unit prices for wheat in 1991 reduced China's wheat import cost by more than 30 percent compared with 1990. China's 1991 wheat imports, valued at \$1.64 billion, accounted for 27 percent of China's agricultural import value.

## U.S. Agricultural Exports to China Declined

Two-way merchandise trade between the United States and China shows the U.S. deficit rising from \$10.3 billion in 1990 to \$12.6 billion in 1991. The value of U.S. agricultural exports to China declined to \$722 million, a 13 percent decrease compared with the previous year. The value of U.S. wheat exported to China declined from \$497.3 million in 1990 to \$363.3 million in 1991, while the quantity of U.S. wheat shipped to China increased from 3.7 million tons to 4.4 million tons (appendix table 9), according to data from the U.S. Bureau of Census. The sharp drop in wheat unit prices, from approximately \$135 per ton in 1990 to \$83 per ton in 1991, reflected not only a decrease in the U.S. price but also an increase in the export bonuses paid to U.S. wheat exporters under the Export Enhancement Program (EEP).

The decrease in wheat export value was offset only partially by increased cattle hide, cotton, and soybean oil shipments to China in 1991. China has managed to increase cotton output during the last couple of years and, therefore, U.S. cotton shipments to China are expected to decline in 1992. China's soybean oil imports are also expected to fall because of substantially raised tariffs. As in the past, the 1992 total U.S. exports to China will continue to be determined mainly by the quantity and price of wheat sold to China.

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## Agricultural Inputs

### Inputs for 1991 Increase

In 1991, farm supplies of manufactured inputs, such as electricity, chemical fertilizer, plastic sheeting, and pesticides, increased. Yearend large tractor and truck stocks decreased slightly, while stocks of small tractors increased (table 4).

China Customs Administration reported that China imported 18.2 million tons (product weight) of chemical fertilizers in 1991, up 11.7 percent from 1990. Of total fertilizer imports, compound fertilizers increased 53 percent to 7 million tons, potassium chloride imports rose 21 percent to 2.4 million tons, and urea imports increased 5.4 percent to 7 million tons.

Table 4--China's major manufactured farm inputs, 1989-91

Item	Unit	1989	1990	1991
Yearend stocks:				
Lrg-med tractors <sup>1</sup>	1,000	848	814	784
Hand tractors	"	6,543	6,981	7,304
Rural trucks	"	625	624	617
Machinery production:				
Lrg-med tractors <sup>2</sup>	"	40	39	52
Hand tractors	"	1,118	1,101	1,335
Rural electricity consumption <sup>3</sup>	Mil. kWh	79,050	84,450	96,320
Fertilizer output <sup>4</sup>	1,000 tons	18,025	19,120	19,882
Nitrogen <sup>4</sup>	"	14,241	14,797	15,127
Phosphate <sup>4</sup>	"	3,728	4,255	4,646
Potassium <sup>5</sup>	"	(56)	(68)	(109)
Fertilizer applied	"	23,571	25,903	28,051
Chemical pesticides	"	208	229	264
Plastic sheeting	"	392	331	na

<sup>1</sup> Capacity of 14.7 kW or more. <sup>2</sup> Wheeled and crawling tractors of 14.7 kW capacity or more. <sup>3</sup> Not all for agricultural production.

<sup>4</sup> Effective nutrient weight. <sup>5</sup> Numbers in parenthesis derived.

Sources: 1991 China Statistical Yearbook; 1992 Statistics Abstract; China's Customs Statistics, No. 1, 1992; and various press reports.

## Outlook for Agricultural Chemicals for 1992

In the 1980's state planners substantially increased investment for the chemical fertilizer industry. During the decade 37 percent of all funds invested in the chemical industry was devoted to increasing fertilizer output (3). Total chemical fertilizer production in 1991 was 19.9 million tons on an effective nutrient weight basis, an increase of 4 percent over 1990. Output for the first quarter of 1992 was nearly 5 million tons, up 5.7 percent compared with the same period in 1991.

Currently China's nitrogen-phosphorus-potassium total use ratio is 1 to 0.28 to 0.003 compared with developed countries ratio of 1 to 0.5 to 0.4. In the eighth 5-year plan (1991-95) and the 1990's China's authorities plan to increase the output of phosphorus and potassium fertilizers. Also there needs to be a change in nitrogen fertilizer production because most of China's nitrogen now comes from ammonium carbonate which has a low nitrogen content. Currently only about 35 percent of the nitrogen comes from urea but by 1995 officials want that ratio increased to 50 percent.

An effort will be made to restructure the output of China's 2,000+ small fertilizer factories. These factories, which contributed about 56.4 percent of total fertilizer output in 1990, will be pushed to adjust the kinds of manufactured products and to reduce energy consumption. About a dozen large urea plants will be constructed in Inner Mongolia, Fuling, Hejiang, and Jinxi. Compound fertilizer plants are scheduled to be constructed at Luzhai, Jining, Xuanhua, and Tongliang (3).

Production of new herbicides and insecticides will increase in 1992. During the eighth 5-year plan, authorities plan to reduce the output of less effective, dangerous, and high-cost pesticides and increase the output of new products that are highly effective, safe, economical, and easy to use. The production of toxic pesticides will be reduced and finally eliminated. The industry plans to improve manufacturing and waste disposal processes, which will reduce environmental pollution (3).

China's farmers are using large quantities of plastic film. Plastic is placed directly on the soil to increase soil temperature and reduce moisture loss. But it is also being used in the construction of temporary green houses. Large areas of these dome like structures can be seen on the outskirts of cities and towns. Farmers use these plastic green houses to raise early season vegetables. During the eighth 5-year plan, officials plan to increase the domestic output and quality of plastic film. They are planning to make film more durable and weather resistant, with special pigments for specific crops, and for condensation-free film (3). Authorities plan to produce 50,000 tons more plastic film this year than last.

## Farm Machinery Services To Expand in 1992

The eighth 5-year plan established the goal for farm machinery production as a 6 percent average annual growth. The primary emphasis will be to continue expanding the output of small tractors to meet the requirements of individual farm households cultivating relatively small plots of land. On the other hand, authorities forecast that the output of large tractors will expand

because old tractors are beginning to wear out, farm size will increase as farmers consolidate fields, and large tractors are required for construction jobs, building up grain production bases, and land reclamation jobs for state farms (5).

During the eighth 5-year plan authorities aim to improve the delivery of farm machinery services to farmers. Currently there are some 43,000 township (town) farm machinery stations. About 38 percent of these stations provide no service functions such as supplying diesel fuel, spare parts, and servicing equipment. Authorities plan to improve and expand service coverage in the next 3 years (2).

## Regulations Governing Conscripted Rural Labor

For thousands of years, China's leaders have conscripted the largely rural labor force to construct irrigation works, roads, and defensive fortifications, including the Great Wall of China. One of the perennial problems for authorities has been to achieve a balance between conscripting too few workers, which allows public work projects to fall into disrepair, and enforcing long conscriptions, which weaken the economic life of the peasantry and create conditions for rebellion. During the commune period 1958-1984 authorities regularly conscripted the rural labor force to build roads, factory sites, irrigation, and drainage works and improve fields. The land contract (township/village) system replaced the commune system in the mid-1980's and disrupted the labor conscription system. Local authorities failed to conscript enough workers and some irrigation and drainage systems fell into disrepair. By the end of the 1980's local authorities had largely overcome earlier deficiencies. The State Council recently published regulations to help local authorities attain the proper balance between light and heavy labor burdens. For more information on the changes in China's rural labor force and labor migration, see the special article "Rural Labor Force Trends in China."

In December 1991, the State Council passed "Regulations on Fees Borne by Peasants and Management of Labor Service" (1). The new regulations stipulate that, on an annual basis, rural workers should spend from 5 to 10 days on compulsory work projects. This labor is to be primarily used in afforestation projects (tree planting), flood prevention, repair and construction of highways and school buildings. The regulations also stipulate that each rural worker should contribute an additional 10 to 20 days on capital accumulation projects (*laodong jilei gong*) such as rural irrigation, afforestation, and tree planting (4).

Assuming that an average worker labored for 300 days each year, these regulations suggest that from 5 to 10 percent of each laborer's work time will be allocated to maintaining or creating capital structures in rural areas. Assuming that there were roughly 420 million rural workers (*nongcun laodongzhe*) in 1991, that each earned a net income of 1,200 yuan per year, and that each worked 300 days a year, then the value of one work day would be 4 yuan. If each rural labor force unit worked the prescribed 15 to 30 days a year then each worker would contribute 60 to 120 yuan per year. On a national scale this contribution would total between 25 to 50 billion yuan, compared with 37 billion yuan invested in fixed assets by the collective rural sector for 1990.

Press articles announcing these labor regulations suggest that in some areas of the country authorities exceeded these prescribed limits which unduly burdened and enraged the rural population. On the other hand, articles also noted that to maintain rural water works, stave off droughts and floods, and promote the flow of goods in rural areas it is imperative that peasants contribute labor.

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## Agricultural Production

Grain production in 1991 fell 2.5 percent to 435 million tons, but output of most other agricultural products increased. The cotton crop rose 26 percent to 5.7 million tons while sugarcane and sugarbeet outturn increased by 21 and 13 percent, respectively. Tobacco farmers increased leaf output by 11 percent while tea growers managed only a 1 percent increase. Oilseed output remained at 33.2 million tons, about the same as last year.

Grain output for 1992 is forecast at 435 million tons, about the same as 1991. China's authorities are predicting a very good summer grain harvest (mostly winter wheat). Government officials are in the process of revamping the urban grain and edible oil rationing system and are allowing markets to affect an increasing number of economic decisions. These policy changes likely will affect the mix of crops produced and certainly will focus the attention of all participants in the rural economy on prices, costs, benefits, profits, and quality of products.

Good grain and oilseed crops over the last several years supported growth in the livestock sector in 1991. Meat output rose to 31 million tons, up 10 percent from 1990. Poultry meat outturn rose to almost 4 million tons, up 22 percent from the previous year. Milk output expanded by 11 percent.

Livestock output for 1992 likely will expand. In the past 10 years both rural and urban consumers have demonstrated that as incomes rise, citizens demand greater and greater amounts of livestock products. Demand likely will be strong again in 1992. Producers will be able to boost output in 1992 because of ample feed supplies from the excellent grain and oilseed crops from 1991.

## Grain

### *Grain Production Dropped in 1991, But Second Best Crop On Record*

Production of wheat, rice, coarse grains, soybeans, potatoes, and pulses totaled 435.2 million tons in 1991 compared with 446.2 million for 1990. Output was down 2.5 percent from 1990, but farmers in 1991 still reaped the second best grain crop on record. Input use rose but heavy rains during the summer months reduced output in the lower Yangzi River Valley and in Manchuria so that yield decreased by 1.7 percent. Area sown to these grain crops decreased by an estimated 1.2 million hectares, to 112.3 million (appendix table 1). Tabulating grain production reported by provincial statistical communiques, newspapers, and radio broadcasts suggests a harvest of 436 million tons, close to the figure reported by the State Statistical Bureau (SSB).

For decades the state-owned Grain Bureau forced stale, low quality cereal products down through their distribution system and consumers had little choice but to accept the products delivered. Recently implemented policy changes have encouraged the growth of markets and at the same time authorities revised operating rules for state-owned enterprises such that product quality is becoming increasingly important. Consumers are willing to pay higher prices for fresh, high quality cereal products. These changes are having far reaching effects on producers, grain handlers, processors, and consumers.

The large 1991 grain crop was harvested as China's administrators were in the midst of dealing with the record 1990 crop of 446 million tons. Granaries in the lower Yangzi River Valley were so full of grain that some wheat had to be stored in makeshift bins and this wheat was damaged by the very heavy rains and flooding in 1991. With grain bins bulging and stocks at a reported 100 million tons, trade officials reduced imports and increased exports. According to China's custom statistics, it was a net grain importer in calendar year 1991, exporting 10.9 million tons compared with 13.5 million tons imported. Excellent grain harvests from 1989 through 1991 boosted domestic supplies so that grain exports rose 88 percent over 1990. Grain imports, on the other hand, fell by 1 percent.

Wheat production in 1991 reached an estimated 96 million tons, down 2.2 percent from 1990. Area sown to wheat rose

0.6 percent to 30.9 million hectares. Yields fell to 3.1 metric tons per hectare, a decrease of 2.8 percent. Yields were up in some parts of the country because of more irrigation, additional chemical fertilizer, and better field management. But these gains were more than offset by the heavy rains at harvest time in the lower Yangzi River Valley, which prevented some farmers from reaping their crops. The quality of the wheat crop in 1991 was also affected by the continual rains and flooding which limited efforts to dry harvested grain.

Rice production for 1991 fell to 183.8 million tons (paddy basis), down 2.9 percent from 1990. Sown area fell to an estimated 32.6 million hectares, down 1.4 percent from 1990. Government policy pressured farmers to keep area in rice rather than switching to more profitable crops. While farmers in the north and northeast regions expanded area sown to rice, these gains were more than offset by decreases in traditional producing regions in the south. Yields fell to 5.64 metric tons per hectare, a decrease of 1.5 percent from the previous year. Heavy rains in the lower Yangzi River Valley during mid-summer disrupted traditional rice cropping systems which affected field preparation, transplanting, growing, and harvesting operations.

Coarse grain production (corn, sorghum, millet, barley, and oats) is estimated to be about the same as a year earlier at 112.3 million tons (appendix table 1). Area sown to coarse grains other than corn is estimated to have dropped slightly but area sown to corn increased slightly. The increase in area sown to hybrid corn varieties and late frosts provided good harvest conditions in the north and northeast. Consequently corn yields increased to 4.58 tons per hectare, up 1.2 percent.

### ***Production Likely Down in 1992***

Total area sown to grain for 1992 likely will decrease by several hundred thousand hectares to 111.4 million hectares in spite of government and party campaigns to maintain area sown to grain crops. This forecast is supported by a recent report from the State Statistical Bureau, which conducted a sample survey of farm 1992 planting intentions and found that farmers planned to sow less grain area in 1992. Also, farmers planted less fall- and winter-sown grain crops in 1991 because of reduced incentives and very dry fall weather.

The record crop in 1990 and the very good crop in 1991 depressed market prices for various kinds of grains in late 1990 and 1991 (9). At the same time, input and consumer goods prices continued to rise, so that farmers intending to raise grains this year will face lowered profit margins. USDA analysts forecast a total grain crop of around 430 million tons for 1992.

China's three grain economies are in a state of transition. Officials are loosening controls on the state controlled grain rationing system which has been in place for more than 30 years. The market grain economy expanded very rapidly in recent years and now has far reaching effects on producers, grain handlers, millers, food processors, producers of livestock feed, and consumers. A large portion of China's grain economy resides in a state of self-sufficiency which is constantly being reduced as transportation links and market forces connect

isolated producers and consumers to larger marketing areas. See the special article "China's Agricultural Marketing System in the 1980's" for an indepth discussion of the changes in the agricultural commodity procurement and distribution systems during the 1980's based on China's official statistics.

### ***The State Grain Economy is Contracting***

In March 1992 the State Council issued a regulation that will eventually raise the retail price of rationed grain to match the purchase price (5). This rationing system was implemented in 1955 and was designed to provide urban residents with low-priced food grains. As procurement prices rose through the years, funds from the state budget had to be used to fill the gap between the farm-gate purchase price and the retail price. For example in 1990 the subsidy totaled 47 billion yuan, 14.2 percent of total government revenue. On April 1, 1992 prices for flour and milled rice were raised so that, over a period of time, they will equal the grain purchase price. Urban residents will be issued new grain ration coupons and the Grain Bureau will continue to supply ration quantities but at the new higher price. Perhaps on the basis of a welfare criteria some urban households will receive cash subsidies to help cover the increased cost of cereal grains. Urban dwellers can purchase cereals from the Grain Bureau's grain stores (*liangdian*) or from open markets.

Guangdong and other provinces that have experimented with grain reform found that grain store sales decreased 45 percent. Urban dwellers with relatively high incomes opted to purchase fresher, higher quality cereals in open markets. Urban, state-run grain stores lost sales because they offered relatively stale and lower quality grains.

The Grain Bureau will continue to sign purchase contracts with farmers to buy rice, wheat, soybeans, and other grains as needed. The contracts will specify the quantities and kinds of grains to be delivered to the Grain Bureau's grain purchase stations. The state will either set the procurement price or purchase grains at market prices. Once farmers complete their grain purchase quotas they will be free to sell products in the open market (6).

The State Council continues to offer a protection price to farmers who wish to sell grain to the Grain Bureau. The purpose of the protection price is to boost farm income and to partially meet a self-sufficiency objective. Note that in the past several years the State Council also offered the protection price. But lack of funds and shortage of storage space limited purchases under this program and hence reduced incentives to farmers (6).

Authorities in 1991 charged the Grain Bureau to operate its various divisions as business enterprises with efficiency and for profit. For example, flour mills, in order to make a profit and stay in business, need to purchase the kinds of wheat that will bring them profits, not losses. If they mill low quality flour that consumers do not purchase, those stocks build up and mill managers learn to process cereal products that will sell. The same principles apply to rice mills. Under the new rules, rice mills in south China found that consumers purchased less low-quality long grain early rice. This forced mills to purchase less

of this type of rice from farmers. These demand and supply conditions will gradually work their way back through the system to farmers who will begin to plant rice that consumers want (10).

### ***The Market Grain Economy Expands***

Through administrative fiat the State Council and the Ministry of Commerce relaxed government controls on grains. The state relaxed its monopsony position as the only buyer of grain by allowing farmers to sell excess grains to any business entity once the grain purchase contracts have been fulfilled. This means that farmers can now sell all grains except wheat, rice, corn, and soybeans at any time to whomever they want. Wheat, rice, corn, and soybeans can be sold to any buyer once the state grain purchase contract has been filled.

The state also relaxed its monopoly position as the only supplier of cereals to urban residents (state workers and employees). Urban residents can now purchase their cereals from either the local Grain Bureau grain stores or open markets.

In past years great emphasis was placed on increasing the quantity of grain produced. With the relaxation, consumers can choose the kinds of cereals they want to consume and the issue of grain quality has become very important. For example in Guangdong province the Grain Bureau has 400,000 tons of poor quality rice in stocks because consumers did not purchase it. Yet farmers continue to raise that class of rice to meet their state purchase contracts because it is high yielding. When the Grain Bureau decides not to accept this class of rice in its procurement contracts, then farmers will be forced to search out and plant seeds of high quality rice. Agricultural scientists also will begin to devote more resources to develop high quality cereals. Over the next decade we foresee a transition period during which farmers and agronomists work together to meet two objectives: To produce higher quality cereals to accommodate consumer preferences and maintain high unit yields.

The value of open market grain transactions increased over the past few years. This has been so: 1) because changes in government regulations permitted grain to be sold in open markets; 2) because the number of open markets rose dramatically; and 3) because the number of participants increased substantially. The number of markets practically doubled in 1991 and the number of transactions rose substantially (3). For example, Shaanxi authorities estimated that of all goods sold in the province, more than three-fourths of the transactions occurred under market conditions. Travel by USDA personnel throughout China's provinces showed increased market activity in large and medium sized cities, small towns, and in rural townships and villages (2). The government has supported this development by investing funds to improve the local infrastructure by building roads and marketing stalls; paving marketing areas; providing electricity, water, sewage, and cleaning services; and providing for a system of standard weights and measures.

Wherever two roads or paths cross in contemporary China one can observe persons buying or selling goods or services. For example grain marketing in Guangdong province is being

handled by 3,500 state-owned Grain Bureau grain shops (*liangdian*) and 20,000 private shops (or stands). For many years only the state owned Grain Bureau was permitted to buy and sell grain. Changes in regulations now permit a wide variety of private, collective, and state-owned enterprises to participate in the buying and selling of grain. Now flour mills, breweries, feed mills, food processors and farmers, as well as the Grain Bureau actively participate in grain markets.

The importance of the market in China's grain economy can also be seen through the development of national and regional wholesale markets. The Zhengzhou market, established in autumn 1990, moved about 600,000 tons of grain by yearend 1991. While this quantity is not large, the market did set price standards which the rest of the country reportedly used for other transactions. In 1991, regional wholesale grain markets were established at Wuhu (Anhui province), Wuhan (Hubei), Weihai (Shandong), Changsha (Hunan), Jiujiang (Jiangxi), Harbin (Heilongjiang), and Changchun (Jilin) (1). After the decision to raise urban grain prices, provinces began to establish wholesale grain markets. For example, Hubei province in mid-1992 already had 65 wholesale grain markets and plans to establish additional markets to handle purchasing, processing, packing, storage, and transportation functions (4). Currently the Grain Bureau transfers about 60 million tons of grain from surplus provinces to deficit provinces. In the future these transfers will likely be handled by national and regional wholesale markets.

A national grain futures market, The Shanghai Grain-Oil Exchange, is slated to be established in the Pudong special economic zone in Shanghai municipality (1). Whereas the Zhengzhou market was designed primarily as a spot market, the Shanghai Exchange is supposed to fill the role of a futures market that will provide a mechanism to hedge price risks of cash or spot market activities.

### ***The Self Sufficient Grain Economy Contracts***

There are several reasons for China's relatively high degree of self-sufficiency. First, China's vast spaces are connected by a relatively poor transportation and communication system which forced some areas to become self sufficient. Secondly, even though there is less stress on local self-sufficiency than before, it continues to have a strong residual effect on many aspects of the rural economy.

During 1991, China's self-sufficient grain economy was eroded by several forces. First, local road networks improved, which brought a larger number of the rural population in contact with the market economy. This meant that households could obtain cereals and feed from other sources. Second, the changes in the grain ration system and the opening up of local grain markets encouraged more farmers to rely on markets. In the past, government administration restrictions prevented many rural residents from entering grain markets. Those restrictions are being dropped and now rural families have the option of producing cereals for themselves, or relying on grain markets for their cereal requirements.

What kind of grain production decisions will farmers in the self sufficient economy make for 1992? Fewer families than in

1991 will follow tradition to produce grain for their families. An increasing number of families will decide that their grain stocks are full, and they can purchase some grains in local markets. These families likely will plant less grain, they will divert some area to cash crops, fruits, and vegetables, and shift some labor from raising grain to earning cash through non-agricultural activities.

### *1992 Grain Production Down Slightly*

In summary, area sown to grain for 1992 likely will be lower than in 1991. Dry autumn weather prevented farmers in the northern part of the country from planting as much winter wheat as they would have liked. Lower profit margins because of lower grain prices and higher input prices, will offset government and Party efforts to boost grain production. Many farm families have large grain stocks and will try to improve their welfare by allocating their land resources to more profitable crops and their labor to activities with higher rates of return. Also farmers will plant less area to low quality grain varieties because farmers now understand through the market place that the price will be lower for those types of grains. Yet they have not had time to search out alternative varieties.

Wheat output for 1992 is projected at 98 million tons, the same as the record 1990 crop. Area is projected at 30.65 million hectares, down several hundred thousand hectares from last year because dry fall weather in northern China prevented farmers from planting winter wheat. Even though winter and early spring weather was dry, farmers should be able to reap a good crop from the fields that were planted, because of normal irrigation and increased input use. Yields are projected at about the level of the past several years at 3.2 tons per hectare.

Since reforms began in 1980 there has been a dramatic increase in the number of vendors on the street selling wheat flour products such as *mantou* (a steamed dumpling), *youtiao* (a bread stick fried in oil), *dabing* (a pan fried bread), *congyoubing* (a pan fried bread with green onions), *baozi* (steamed dumplings filled with a mixture of vegetables and meat), and small loaves of leavened bread. There has also been a rise in the number of specialty shops which sell a wide variety of cakes, crackers, and cookies. Regular food provision stores sell western style bread, a variety of noodles, crackers, and cookies. The diversity of wheat flour products has expanded greatly and the quality of the products, taste, appearance, and packaging has improved. In 1982 instant noodles were a rare item in China but by 1992 consumers on the street could buy the product (2).

Rice area likely will be reduced to 32.3 million hectares as farmers shift available paddy land to more profitable crops (cotton, oilseeds, sugar, fruit and vegetables). Farmers are likely to plant less area to low quality rice because of the difficulties in marketing the product. The 1990's likely will be a period of transition as rice farmers try to work out solutions to a new set of problems in which they have to worry not just about quantity and costs, but about quantity, quality, and costs. Forecasting output in these new conditions is difficult because there is no track record. We put forward a very tentative 182 million ton paddy crop for 1992, down 1.8 million from the previous year.

Corn production dominates China's coarse grain economy (appendix table 1). Yet analysis of the corn portion of this economy has been most difficult in recent years. In 1990 and 1991, USDA analysts forecasted that corn production would grow slowly, when in fact output rose steadily. Projections were based on several elements. On the one hand it was known that feed mills were sending strong signals that they wanted more corn as a feedstuff. On the other hand it was known that farmers in Manchuria and north and northwest China were having difficulty selling corn in the market place. Corn prices fell during 1990 and 1991.

While provincial Grain Bureaus wanted to sell corn into the international market to earn foreign exchange, central government authorities wanted to keep sufficient stocks. Provincial Grain Bureaus were reluctant to ship corn to southern provinces because payment would be in local currency and there were problems in finding the means to transport the product south. At the same time, central government authorities worried that if the Grain Bureau did not purchase the corn, farmers would grow less in subsequent years. Grain Bureaus were reluctant because such action would tie up so much working capital, and storage space for corn was already stretched to the limit.

As a result, it appeared that there were few incentives to increase corn output; however, output rose. It was expected that purchases would be reduced due to the high level of stocks, but the opposite happened. The government provided funds for the Grain Bureau to purchase and store corn, which sustained both prices and farmers' desire to grow more corn.

How should the corn puzzle be viewed in 1992? Many facets of the old puzzle are still in place, but with some new pieces. Current reforms have affected the Grain Bureau and the government has charged Grain Bureaus to follow two rules in 1992. First, Grain Bureau entities must operate on a for profit basis and not expect subsidies. Second, Grain Bureaus should earn foreign exchange.

Currently, corn is being shipped out of Manchuria under these two rules. Some corn is being shipped domestically to south China, where corn prices are higher than in the world market, to meet the profit criteria. But these shipments are constrained because of the lack of rail cars. Some corn is being exported to other Asian countries to earn foreign exchange.

Corn shipments to domestic and foreign markets will work down stock numbers in surplus areas and have a tendency to support corn. As was the case in the 2 previous years, the primary unknown is government policy regarding use of state funds to purchase corn. Since 1992 is a transition year, it is expected that the government will take measures to maintain a steady course and will again use state funds to purchase corn. Consequently, corn production for 1992 is projected at 96 million tons, about 3 million tons below last year.

China is both a major barley producer and importer. Information newly released by the Ministry of Agriculture enabled USDA analysts to re-estimate China's barley area, yield, and production numbers for the past several decades. See the special article, "China's Barley: An Analysis of

Production, Consumption, and Trade" for a detailed discussion of the methodology and results.

Barley output in 1991 suffered from the torrential rains and floods which swept through China's major barley growing area in the lower Yangzi River Valley. The heavy rains reduced output and affected grain quality, especially for brewing barley. Incomes rose sharply in the 1980's and consumer demand for beer had increased. Demand for quality brewing barley exceeded supplies, and imports of brewing barley reached nearly 1 million tons in October/September 1990/91.

### *Grain Trade in 1992*

Calendar year wheat imports (all calendar year data come from China's Customs Administration) fell from 14.88 million tons in 1989, to 12.53 million in 1990, and to 12.37 million in 1991 largely because of excellent domestic wheat crops from 1989 to 1991 (appendix table 7). In the past 3 years population and income growth plus changes in food preferences have bolstered the demand for wheat. With urban reforms underway, authorities do not want to risk urban instability by running short of basic food supplies. These factors support a relatively high level of wheat imports for 1992. In July/June 1992/93 year, USDA is forecasting wheat imports at 12 million tons.

China is both a rice importer and exporter. In calendar year 1989 China imported the unusually large quantity of 1.2 million tons of rice. In 1990, imports totaled 60,000 tons, but rose to 140,000 tons in 1991. China likely will continue to import high quality rice in 1992. China exported 320,000 tons of rice in calendar year 1989, 330,000 in 1990, and 690,000 in 1991. USDA forecasts that China will export 400,000 tons in 1991.

China traditionally has been both an exporter and importer of corn. CEROIL imported 438,810 tons in calendar year 1989, 403,560 in 1990, and none in 1991. With the record corn crops in 1990 and 1991, USDA projects that October/September 1991/92 imports will be negligible. CEROIL exported 3.5 million tons of corn in 1989, 3.4 in 1990, and 7.8 in 1991. Corn exports out of Manchuria to Japan, the former Soviet Union, South Korea, and other Asian ports continued into spring 1992 at a rapid pace. USDA projects that corn exports for 1991/92 will reach 10 million tons and remain near this level in 1992/93.

Barley imports on a calendar basis are estimated to be 800,000 tons in 1991, up substantially from 650,000 tons in 1990. Most of the increase stems from larger imports of malting barley to supply China's growing beer industry, which rose to 8.1 million tons in 1991, up 21 percent from 1990. Beer output rose 30 percent during the first quarter of 1992 compared with the same period in 1991. USDA projects barley imports for October/December 1991/92 likely will decrease to 800,000, down from 977,000 tons from the previous year.

Pulse exports averaged over 100,000 tons in the 1960's decade and rose to just over 500,000 tons a year at the end of the 1980's. In 1991, pulse exports expanded to 800,000 tons worth \$235 million. The bulk of China's pulse exports go to Hong Kong, Japan, India, Italy, Netherlands, and Cuba.

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## **Oilseeds**

### **1991 Oilseed Production Unchanged from 1990**

Unfavorable 1991 weather in oilseed growing areas offset production gains from a small increase in sown area. Consequently, oilseed production in 1991 remained at the 1990 level. The good crop years of 1990 and 1991 reversed the trend of decline since the record in 1985. Total sown area for oilseed, including soybeans and cotton, increased from 22.3 million hectares in 1990 to 23.3 in 1991. Total oilseed production remained at 33.2 million metric tons (mmt), only a 0.1 mmt below 1990. Decreased soybean production offset cottonseed and rapeseed gains.

In recent years, the composition of oilseeds produced has changed as rapeseed and cottonseed increased while soybeans decreased. The soybean share of total oilseed production slid from 38 percent in 1988 to 29 in 1991. Rapeseed increased from 16 percent in 1988 to 22 percent in 1991 and cottonseed from 23 percent to 29 percent.

The cottonseed production had the most significant increase among all of the oilseeds in 1991. It increased by 26 percent from 1990 to 9.65 mmt in 1991. The most important factor was the sizable growth in cotton-sown area. In 1991, cotton-sown area rose by 17 percent from the 1990 level. Most of the area increase was intercropping (summer cotton) and late cotton planting. Another factor contributing to the rise in production was the increase in the use of plastic sheeting, which improved the average yield.

With relatively higher returns, rapeseed continued to be a preferred crop. The sown area for rapeseed increased by 10 and 11 percent in 1990 and 1991 from the previous year. However, rapeseed production in 1991 only increased by 7 percent to 7.44 mmt. Rapeseed production would have been much higher but floods damaged the crop in Henan, Anhui, and Jiangsu.

In China, farmers continue to shy away from planting soybeans. Soybean-sown area suffered another decrease, falling by 7 percent in 1991 in addition to the 6 percent drop in 1990. With losses incurred from the 1989 drought, peasants believed that soybeans were less drought tolerant than corn. Furthermore, the increase in chemical fertilizer use has reduced the need for planting soybeans to boost soil fertility. Although soybeans are considered a grain crop in China, it has not received the same attention as the other major grain crops over the last decades. The government increased procurement prices for rice, wheat, and corn on April 1, 1992, but not soybean prices. The decline in soybean-sown area combined with flooding in Heilongjiang caused production to decrease by 13 percent from 1990 to 9.6 mmt in 1991.

Peanut-sown area in 1991 declined slightly, falling by about 1 percent. Flood and drought conditions in various peanut growing areas caused the average yield to decline slightly. Peanut production declined by about 3 percent in 1991 from 1990.

Sunflowerseed yield was the most affected by weather among all oilseed crops in 1991. Although sunflowerseed area increased by 2 percent in 1991, production declined by 18 percent to around 1.1 mmt. The lower yields were the results of cloudy, wetter summer weather in growing areas.

### ***Exports of Oilseeds Rose in 1991***

Increases in 1990 oilseed production (16 percent over 1989) boosted the exports of oilseed in 1991. An 11 percent increase in soybean production in 1990 (11 percent over 1989) and strong international demand for peanuts in 1991 were responsible for the increase in 1991 oilseed exports. Soybeans and peanuts already account for over 85 percent of total oilseed exports. Exports increased by 18 percent from 1990 to 1.11 mmt in 1991.

Even though feed demand for soybeans continues to increase, because of the desire to improve feed protein content, the government's decision to increase the portion of foreign exchange earnings retained by provincial governments has created a strong incentive for provinces in the Northeast to export rather than sell to deficit provinces. The transition of trade with the former Soviet Union and Eastern European countries from barter terms to a cash or credit basis also decreased soybean sales. However, new markets have opened up for soybean exports in Indonesia, Japan, and Malaysia.

Peanut exports increased by 10.4 percent to 427,640 tons in 1991. Unlike other oilseeds, which are mainly crushed for oil, only slightly over half of peanut production is used for oil. Since the last decade China has remained one of the biggest exporters of peanuts for direct consumption. Therefore, the portion for direct consumption (about 50 percent) is very sensitive to international market conditions. The demand for China's peanuts was very strong because of a decrease in U.S. production. As a result, peanut trade prices increased substantially. The 10.4 percent increase in China's peanut exports brought a 33 percent increase in exchange earnings from those exports. With the strong demand for domestic crushing, all other oilseed exports remained at about the same level as 1989 despite the increase in production.

### ***Imports of Edible Oils Fell and Meal Exports Decreased in 1991***

The increase in oilseed production in 1990 (11 percent) contributed to a decrease in edible oil imports. Imports fell by about 45 percent to 612,000 tons in 1991. To improve its foreign exchange earnings and narrow the official and market rates in the Shanghai foreign exchange center, China's currency was devalued in December 1989 from 1 US\$ for 3.72 yuan to 4.72. It was then devalued several times in 1992, finally falling to 1 US\$ for 5.5 yuan. The increase in tariffs for vegetable oils also had a negative impact on edible vegetable oil imports.

Contrary to the increase in oilseed production in 1990, meal exports declined by 10 percent to 3 mmt in 1991. The desire to improve domestic-livestock-feed protein content and the government policy of returning oilseed by-products to peasants, reduced the supply of meals available for export.

### ***1992 Oilseed Production Likely To Remain High***

Area planted to oilseeds is expected to increase in 1992. The two back-to-back bumper grain harvests in 1990 and 1991 drove down market prices of crops in China. China's government procures about 75 percent of oilseed production and about one-third of grain production. Grain prices in the open market or government negotiated prices, therefore, would be affected more than oilseed crops by demand-and-supply conditions. After the bumper crops of 1990, grain prices decreased faster than oilseed prices, an average of 16 percent for grains as compared to 9 percent for oilseeds in the open market in 1990. The reduced supply of soybeans in 1991 and increased demand for livestock feed have pushed up prices in the open market. Soybean area will likely increase in 1992. No change in sown areas for other oilseed crops is expected.

Assuming normal weather conditions in 1992, oilseed (including soybeans and cottonseed) production should increase from 1991.

China's government initiated a policy change in May 1991 to reduce urban subsidies on staple goods. Prices of edible oils were raised by an average of 158 percent, while grain prices were raised by an average of 54 percent. The price increases created relatively higher edible oil prices in the urban markets and will encourage peasants to increase oilseed production and reduce grain production. However, in the short run, the government will use stocks to influence crop prices and control demand, as well as using fixed procurement prices to influence crop-sown area and production. Government policy is expected to stabilize grain and oilseed production for the next year or two. We anticipate that area sown to oilseeds in the next year or two will be about the same as in 1992. The only exception is likely to be soybeans, where we anticipate an increase in sown area.

The outlook for China's crop production and consumption in the longer term -- 5 to 10 years -- is very different. Urban per-capita grain consumption has traditionally been subsidized at a very high level. To meet this high level of consumption, the government has continued to raise procurement prices to encourage farmers to produce. The negotiated prices of grains in recent years have been higher than international prices. With the recent introduction of policy measures to compensate urban residents with cash and gradually raise coupon prices to the market level, a tremendous change in consumption patterns is expected. Without the burden of its urban rationing policy, the government eventually may abolish its procurement policies. Prices will begin to perform as the mechanism for allocating resources in producing a product mix determined by consumer choices.

Given the reform in the urban rationing system, income growth in the next 5 to 10 years would reinforce the changes in consumption patterns. Income elasticities for oilseed crops are much higher than staple grains of rice and wheat. The high income elasticities for meats would also cause the derived demand for corn and soybeans to increase. Food-grain sown area would likely decline in favor of oilseeds and corn for livestock production. See the special article, "Projections of China's Food Consumption and Production Patterns in the Year 2000: Implications for Trade" for a detailed look at a number of different scenarios for China's future food and feed grain production and consumption patterns.

### ***Trade of Oilseeds, Edible Oils, and Meals Likely To Decline in 1992***

Exports of oilseeds will likely decline in 1992 due to increased domestic crush demand for edible oils and feed. New government policy requiring grain enterprises to be responsible for profits or losses will encourage the soybean surplus region to sell oilseeds to the southern provinces for higher prices instead of earning foreign exchange. The relatively higher edible oil prices in urban markets is an incentive for increased supply. In addition, decreased barter trade and increased cash trade with the former Soviet Union and Eastern Europe will reduce oilseed exports (especially soybeans) to these countries.

The weaker international demand for peanuts will likely depress peanut prices and decrease the incentive to export.

The increase in population growth, with a slight decrease in oilseed production and vegetable oil stocks will likely raise imports of edible oils in 1992. However, the emphasis will continue to be on cheaper palm oils. The rapidly growing livestock and aquatic sectors continue to demand more meal and, as a result, meal exports are expected to decrease slightly in 1992. China's government also allows peasants to keep more oilseed byproducts when crops are turned in for crushing, making less available for export.

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### ***Cotton***

China's 1991/92 (August-July) cotton production was significantly higher than most early estimates indicated. The 1992 *China Statistical Abstract* reported 1991/92 production of 5.675 million tons, an increase of 26 percent from 1990/91. Cotton-sown area in 1991/92 was 6.54 million hectares, up 17 percent from 1990/91. The two leading cotton producing provinces, Shandong and Henan, increased output about 40 percent (table 5).

**Table 5--Cotton production, selected provinces, 1987-1991**

Province	1987	1988	1989	1990	1991
1,000 tons					
Shandong	1,244	1,137	1,025	975	1,351
Henan	570	637	527	676	948
Xinjiang	280	278	295	469	639
Hebei	626	577	536	571	634
Jiangsu	444	562	485	464	557
Hubei	439	362	313	517	491
Anhui	186	206	170	236	271
Hunan	56	44	67	120	149
Sichuan	102	88	85	115	146
Shanxi	78	87	102	112	112
All others	220	171	183	253	377
Total	4,245	4,149	3,788	4,508	5,675

Sources: China Agriculture Yearbook, 1988-91; and China Statistical Abstract, 1992.

Favorable weather throughout the fall of 1991, particularly later than normal frosts and a dry harvest season, boosted cotton yields significantly over 1990/91. Production also increased because of additional plantings of late cotton in Henan, Anhui, and Jiangsu provinces. Excessive spring rains encouraged many farmers in these east central provinces to replace moisture-sensitive crops such as soybeans with a delayed late spring or early summer planting of economic crops such as cotton or tobacco. Furthermore, the state procurement price for cotton is still quite favorable relative to competing crops, so many farmers in cotton growing provinces increased area sown to cotton.

State cotton procurement in 1991 went smoothly, with only scattered instances of the Jute and Cotton Corporation (the official cotton purchasing arm of the central government) paying farmers with IOUs or refusing to purchase cotton. Although information about cotton stocks is still considered a state secret in China, two successful cotton harvests in a row, relatively trouble-free state procurements, low levels of exports, and a decline in yarn output late in 1991 pushed cotton stocks to extraordinarily high levels.

### *Yarn Consumption Falls in 1991*

At a series of meetings during the summer of 1991, central planning officials moved to rein in yarn production. Cloth and finished textile good inventories were increasing rapidly. In an effort to force textile enterprises to both upgrade the quality of output and market their growing inventories, the State Council approved a 5 million ton limit for calendar year 1991 and 1992 yarn output. Provincial and local governments were authorized to impose raw material embargoes and refuse bank loans to textile enterprises exceeding their yarn output targets.

Despite large cuts in output by many of the major yarn producing provinces in the last few months of 1991 (figure 1), annual production still reached 4.55 million tons and sixteen provinces surpassed their plan target by a total of 467,741 tons. Although yarn output was reduced late in 1991, production early in the year was high enough to keep output higher than the 5 million ton target and only 3 percent below 1990.

### *Trade Declined in 1991/92*

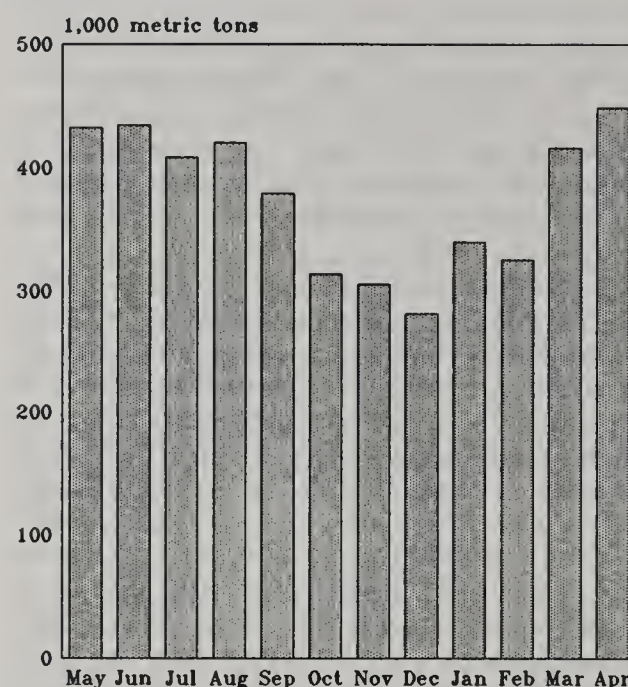
China's 1991/92 cotton trade declined somewhat from 1990/91 levels. Imports for 1991/92 are estimated to be 272,153 tons and exports 185,064 tons (table 6).

**Table 6--China's marketing year cotton trade<sup>1</sup>**

Item	1989/90	1990/91	1991/92	1992/93
Metric tons				
Imports	407,794	481,167	272,153	87,091
Exports	188,330	202,482	185,064	239,495

<sup>1</sup> Official WASDE numbers. 1991/92 and 1992/93 are estimates.

**Figure 1**  
**Monthly Yarn Production,**  
**May 1991 - April 1992**



\* Includes pure cotton, cotton/synthetic blend, and pure synthetic yarns.  
Source: ERS/China database.

Good harvests in 1990 and 1991 dampened import demand. Cotton imports in 1991/92 fell 43 percent. Despite very high domestic stock levels, imports did not fall as much as might be expected because of continued demand for certain specific types and qualities of imported cotton for blending purposes.

Exports in 1991/92 fell 9 percent to 185,064 metric tons because world prices dropped to nearly the same level as China's domestic procurement price of 6000 yuan per ton (using official exchange rates). If processing, packaging, transportation, wages, and management fees are added to the domestic price, cotton export corporations cannot export profitably. An export corporation would have to receive a subsidy to earn a profit. However, in early 1991 the central government eliminated all export subsidies. The only way to obtain a subsidy now is by receiving special approval from the State Council, and this is not considered likely.

### *Production Up for 1992/93*

The state cotton procurement price and the central government mandated supplemental input incentives (35 kilograms of fertilizer, 2.5 kilograms of diesel fuel, and a specified cash advance per 50 kilograms of cotton sold to the state) will remain unchanged in 1992. Two successive years of bumper grain harvests have caused grain prices to decline, insuring that cotton production in 1992 will remain lucrative and competitive relative to its primary competing crops -- corn and peanuts. However, some provincial officials have indicated that they will reduce (and in at least one case eliminate) the additional provincial and local cash payments and input allocations to cotton farmers. However, supplementary cash or input allocations are generally found in deficit-production provinces (Jiangsu, Anhui, and Sichuan) and not used in surplus-

producing provinces (Xinjiang, Shandong, and Henan), so the overall impact is expected to be negligible for the 1992/93 crop.

Early planting intention reports for China suggest that 1992/93 cotton-sown area will likely be slightly higher than 1991/92. Although still unpublished, the State Statistical Bureau (SSB) has apparently completed its planting intention survey. Based on a 1991/92 area of 6.35 million hectares, the report stated that 1992/93 sown area would increase about 500,000 hectares. Subsequently, other officials in China agreed that sown area was up, though only 300,000 to 400,000 hectares. Now that the revised 1991/92 figure of 6.54 million hectares has been released by SSB, the area forecast was adjusted upwards to 6.65 million hectares or up 300,000 tons from the revised area figure). Assuming a slightly higher area and a moderate yield of 835 kilograms per hectare, 1992/93 cotton production is likely to fall to between 5.5 and 5.6 million tons.

Despite continued low levels of cotton yarn production in January and February 1992, a subsequent surge in output in March and April suggests that the official 1992 yarn target of 5 million tons, and by implication the government policy to reduce yarn output, has been put aside. Therefore, domestic cotton consumption is expected to rise in 1992/93, and total output will likely rise to as much as 5.5 million tons.

Cotton trade is the most difficult aspect of the 1992/93 year to forecast. Although cotton stocks are expected to be extremely high, the normal expectation of increased exports is diminished by China's current high domestic procurement price and the low world market price. It seems likely that there will be some increase in exports, though it is doubtful the central government will be willing to assume a large subsidy burden to support that trade. Therefore, cotton exports in 1992/93 are expected to see a modest increase to 239,495 metric tons. A return to higher exports will depend on either increases in the world cotton price or a decline in domestic procurement prices.

Cotton imports will likely fall to about 87,091 metric tons in 1992/93. Although this is a steep decline, it is still not as much as domestic production predictions and current stock levels might suggest. Cotton imports have already been falling gradually over the last several years (table 6), and much of the remaining imported cotton is targeted for specific blending purposes. Therefore, China is expected to continue to import cotton in 1992/93, though at a sharply reduced pace in response to the pressures of burgeoning domestic supplies.

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## Sugar

China's 1991/92 (October-September) sugar output is expected to greatly exceed most initial estimates. The most recent information from China's Ministry of Light Industry (MLI), which oversees sugar milling and refining, suggests total 1991/92 output may rise 1 million tons to 8 million. Sugarcane production in 1991/92 rose 22 percent from 1990/91 to 70 million tons and sugarbeet production rose 14 percent to 16.5 million tons. Sugarcane and sugarbeet area both rose over the previous year, reaching 1.2 million and 750,000 hectares, respectively (table 7).

Table 7--China's sugar production, consumption, and trade

	1989/90	1990/91	1991/92	1992/93
1,000 metric tons, raw value				
Production	5,618	6,765	8,100	8,500
Consumption	7,450	7,500	7,650	7,800
Imports	1,145	1,051	1,000	1,000
Exports	624	331	800	1,000
Change in stocks <sup>1</sup>	-1,311	-15	250	700

<sup>1</sup> Implied change in stocks.

Source: Official USDA estimates (WASDE). 1991/92 and 1992/93 are estimates.

Notwithstanding the huge surge in sugar output, the most important development for China's sugar industry was the central government's late 1991 announcement that all controls over sugar rationing were eliminated and sugar pricing and distribution were liberalized. Although retail prices were freed and subsidies all but eliminated in many cities prior to the national policy, the central government announcement brings the entire sugar sector under the new regime. The specific changes announced included:

- Eliminating all government-set quotas for refineries to allocate sugar to government-run industrial and commercial enterprises.
- Increasing marketing channel flexibility and making it easier for sugar-surplus provinces to export to sugar-deficit areas.
- Increasing the freedom of commercial bureaus to pay market prices for the sugar they purchase from refineries. The official state price will now be a guidance price, and

the price paid by commercial bureaus can fluctuate 10 percent above or below the state price.

- Decontrolling retail sugar prices and the prices for any province-to-province sugar sales handled by provincial commercial bureaus.
- Eliminating sugar rationing for all urban and rural consumers.
- Establishing a national and local system of sugar storage.
- Establishing two sugar wholesale markets, one at Tianjin Municipality in the Northern beet-growing region and one at Guangzhou Municipality in the Southern cane-growing region.

To a certain extent these changes only legitimized and extended to the whole nation what had already become practice in many areas as sugar procurement stations, mills, refineries, industrial enterprises, and commercial bureaus attempted to cope with an increasingly severe price squeeze caused by falling free market prices and high state-set procurement prices. Nevertheless, the changes are significant because sugar has always been considered a key commodity.

### ***Sugar Crop Output Increased in 1991/92***

The 1991/92 (October/September) sugarbeet and sugarcane crops saw record output and above average sugar content (normal averages are roughly 15 percent for beets and 13 percent for cane). Substantial sugar crop and refined sugar price increases in late 1990, combined with the opening up of the sugar sector, promoted increased sown area and healthy yields for the 1991/92 cane and beet crops. Although increased sown area was the most important factor involved in the 1991/92 surge in production, improvements in yield and water management and wider use of hybrid seed also contributed heavily.

With sugar output for 1991/92 expected to reach or even exceed 8 million metric tons, the second consecutive year of record sugar output is straining China's procurement, storage, and distribution systems. Furthermore, some sugar mills/refineries are having trouble paying farmers for their beet and cane crops because of depressed raw/refined sugar prices. Localized gluts are reported to have depressed the price of refined sugar and made it difficult for refineries to market output.

Imports in 1991/92, principally carried out under government-to-government sales, are expected to fall slightly below 1990/91 levels to about 1 million tons because of another year of record sugar output, the high level of stocks, and continued strict government control over sugar imports. China's major sugar suppliers continue to be Cuba, Australia, and Thailand.

Sugar exports in 1991/92, however, will increase markedly from the estimated 331,000 metric tons shipped in 1990/91. Although exports early in 1991/92 were running low because of reduced price spreads for "tolling" (the vast majority of China's

sugar exports are from "tolling" -- importing raw sugar to be refined and then reexported in order to utilize excess refining capacity), the huge 1991/92 sugar output will likely prompt an increase in exports. Although tolling spreads are not expected to rise significantly in the remainder of 1991/92, keeping these exports flat or only slowly rising, large mill/refinery stockpiles have apparently prompted an avalanche of calls to international traders quoting ever lower prices for domestic sugar. Abundant domestic supplies and increasingly competitive price quotes will likely push China's 1991/92 sugar exports up to about 800,000 tons.

### ***Another Record Year in 1992/93***

Total sugar output in 1992/93 is expected to rise to around 8.5 million tons as sugar crop production continues to be highly profitable relative to competing crops. Recovery rates are also expected to grow as milling and refining efficiency continues to improve. Sugar crop area and production will likely continue to grow in 1992/93, though at a slower rate than in the previous year. Despite localized gluts of sugar this year, relatively high procurement prices will maintain moderate upward pressure on sugar crops and refined sugar output.

However, the possibility exists of a downturn in area and production if mills, responding to the price squeeze between raw materials and finished product, choose to ignore the government's guiding procurement price. Retail sugar prices have been declining since 1991, reducing the cash flow for many mills and increasing the pressure to reduce payments to farmers. Although the government has not freed sugar procurements, there are reports that mills have been or will be forced to renegotiate the government's guiding price with farmers in order to stay profitable. Despite these mill problems, southern provincial officials have reported that area planted to cane in 1992 is about the same as in 1991. Combined with continued growth in beet area, particularly in Northwest China, 1992/93 sugar crop and sugar output may produce a third record year.

The overall long-term outlook for sugar demand in China is very positive. However, one view posits that short-term demand for sugar will be flat because urban markets are saturated (reflected by stable or declining prices for sugar and processed or baked goods containing sugar) and because marketing and distribution channels are inadequate to tap the largely untouched rural market. An alternative scenario for short-term demand points out 3 reasons why demand might steadily rise, even in the short-term: population growth, a concerted government effort to reduce the production and use of artificial sweeteners, and continued growth in the food processing industry.

China's government asserts that it is concerned about the possible negative health effects of artificial sweeteners, as well as the possibility that sweeteners might displace sugar in food processing. China's current output of saccharin, the only sweetener produced in large quantities, is reported to be 12,000 tons a year (the sugar equivalent of about 6 million tons). However, the government recently announced new regulations limiting the amount of artificial sweeteners allowed in processed foods and soft drinks. If output stagnates, or even declines

(depending on the effectiveness of the central government's policies), demand for sugar to replace artificial sweeteners is likely to rise. The rapid development of other forms of sweeteners, such as corn syrup, is not expected.

Government-to-government imports in 1992/93 will likely continue at the low rate of 1 million tons or less because of the huge 1991/92 crop and another bumper crop forecast for 1992/93. Exports, however, are expected to increase 200,000 tons to 1 million as refineries attempt to clear rising stockpiles. The only restraint on sugar exports will be the domestic price/world price spread. However, the domestic ex-refinery sugar price fell in 1991/92 as output and stocks soared. With the 1992/93 record crop, the retail price for refined sugar will likely continue to fall, spurring rising levels of exports.

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## Tobacco

China's total leaf tobacco output in calendar year 1991 reached an estimated 2.94 million metric tons (farm sales weight), an increase of 12 percent from 1990 output. Flue cured tobacco production reached 2.7 million metric tons, an increase of 19 percent. Total 1991 tobacco leaf area rose 13 percent to 1.8 million hectares and flue cured tobacco area rose 16 percent to 1.6 million hectares. However, 1991 cigarette production fell 3 percent from 1990 output to just under 32 million cases (250 cartons per case and 200 cigarettes per carton).

In September of 1991, concern over rapidly rising cigarette stocks, particularly of lower quality brands, prompted the central government to impose a 31-million-case ceiling on cigarette output. In response to the new policy, cigarette inventories were reported to have declined by 375 million cartons between September and December of 1991. In addition, output of 200 of the lowest quality brands was suspended altogether.

Although 1991 output surpassed the government mandated ceiling, cigarette production was less than 1990 output and was

less than pre-policy change estimates. Despite the reduction in the gross volume of cigarette production, the value of cigarette output rose because of the emphasis on higher value, better quality cigarettes. In addition, despite the decline in output, 1991 net government tax revenues from cigarette production rose 3 percent from 1990 levels.

Tobacco leaf imports in 1991 rose 13 percent from 1990 imports, reaching 14,699 metric tons, as cigarette manufacturers pushed to acquire higher quality tobacco leaf to meet the demand for better quality cigarette brands. Exports in 1991 surged to 72,570 metric tons, from only 32,091 in 1990, because of a diversified and expanding number of export markets. The former USSR, Belgium, Hong Kong, and Singapore were the major export markets in 1991. Exports to the United States in 1991 were only 2,730 metric tons. Cigarette imports in 1991 rose 24 percent from 1990 to 5.3 million pieces, while exports climbed 54 percent over 1990 to over 16 million pieces. Imports rose to meet demand for high quality brand name cigarettes and in response to the central government's attempts to reduce cigarette smuggling. Exports have increased dramatically as revenues earned by exporters rose and as China expanded exports to old markets and developed new markets.

## Production Up for 1992

Rising demand for high quality tobacco leaf and increased input allocations by central and provincial governments will likely prompt increased total 1992 production despite only a very small increase expected for sown area. The 1992 State Statistical Bureau farmer planting intention report indicated China's 1992 cash crops, including tobacco, would likely see at least modest increases in area. Despite a continuation of the ceiling on cigarette output in 1992, increased profits by cigarette factories during 1991 will keep demand for tobacco leaf high in 1992. Traditionally, local governments have encouraged high levels of cigarette production because of the high percentage of local taxes that can come from cigarette factories. Accordingly, both local and central government officials hope to maintain or even increase fertilizer and other input allocations (tobacco is a relatively fertilizer intensive crop) to tobacco farmers.

Cigarette production in 1992 is expected to slow because of the government-mandated output ceiling, but it will likely be slightly higher than the ceiling. Statistics from the first quarter of 1992 show cigarette output 4 percent higher than the same period of 1991. Continuing the policy begun in 1991, cigarette output will focus on the better quality name brands, fueling continued high levels of foreign leaf imports for blending purposes.

Total 1992 tobacco leaf imports are expected to increase again because demand for high quality leaf will continue to outstrip domestic production (despite the government's policy to increase and diversify the 1992 output of a range of tobacco leaf varieties). Zimbabwe should continue to provide the majority of China's imported flue cured leaf tobacco. While blue mold technically bans the United States from exporting tobacco leaf to China, current high U.S. leaf prices would also effectively block any significant exports.

Tobacco exports are also expected to increase in 1992, despite the possibility of reduced leaf exports to the former USSR.

Recent statements by China National Tobacco Import and Export Corporation (CNTIEC) officials indicate that 1992 exports will likely follow the trend begun in 1991 and again rise 50 percent over previous year levels. CNTIEC officials also report China will aggressively pursue export markets in the Middle East, Southeast Asia, and Eastern Europe in 1992. Total 1992 exports, therefore, are expected to fall between 110,000 and 111,000 tons, of which flue cured tobacco is expected to account for over 100,000 tons. Contracts are reported to be already in place for exports of more than 100,000 metric tons of flue cured leaf. CNTIEC officials have stated that if 1992 flue cured output rises higher than currently expected, there will likely be a concomitant increase in exports.

Cigarette exports are expected to continue to rise rapidly in 1992. In early 1992, China sent trade delegations to Vietnam, Romania, the Russian Federation, Kazakhstan, Byelorussia, Uzbekistan, and Ukraine to seek cash or barter deals, as well as the possibility of establishing joint production operations in those countries using inputs from China. China has also begun an aggressive marketing campaign in a number of new Asian markets. Despite the ceiling on domestic cigarette output, exports in the first quarter of 1992 increased 49 percent over the same period in 1991. If exports continue at the same pace through the year, total 1992 exports may rise 50 percent over 1991 levels.

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### Livestock and Feed

China saw healthy growth across the whole range of animal husbandry activities in 1991, propelled by extremely successful grain harvests during the last 3 years. Cow milk production grew rapidly, and the continuation of the European Economic Community (EEC) dairy aid project helped to raise milk production and consumption in 20 major cities. Livestock production is expected to continue to rise in 1992.

Feed output will continue to grow in 1992, though the most important developments may be in improved feed quality and expanded distribution channels as opposed to simply increased output (table 8). Total manufactured feed (mixed and compound feed) production in 1991 reached 32 million metric tons, up 1 million tons from 1990 (1). Guangdong and Shandong provinces, China's largest producers of mixed feed, increased 1991 output by 20 percent from 1990 to reach a combined total of 9.5 million metric tons of mixed feed.

### Livestock Output Increased

The gross value of livestock output in 1991 increased 3 percent over the previous year based on comparable prices. Red meat, cow milk, and sheep wool output in 1991 grew by 8, 11, and 0.4 percent, respectively (appendix table 4). Total meat output

**Table 8--China's manufactured feed production, 1987-91**

Item	1987	1988	1989	1990	1991
Total feed <sup>1</sup>	22.51	29.57	31.00	31.00	32.00
Compound feed	14.24	14.79	18.60	na	na
Mixed feed	8.27	14.79	12.40	na	na

<sup>1</sup> Totals may not equal the sum of the parts because of multiple sources and rounding.

Sources: 1991 China Agriculture and Trade Report, USDA/ERS, July, 1991; and China Daily, May 20, 1992, p. 2.

(red meat and poultry) in 1991 reached 31.4 million metric tons, up 10 percent from the previous year and surpassing the official eighth 5-year plan target (1991-95) for total meat production of 30 million tons. Poultry meat output alone rose 22 percent to 3.95 million tons. Pork production, the most important component of China's livestock sector, continued its rapid growth as hog yearend inventory reached 372 million head, hog slaughter reached 327 million head, and pork output rose 8 percent to 24.5 million tons. Sheep and goat yearend inventory saw a modest decline of 2 percent to 206 million head (appendix table 4).

The rate of China's hog slaughter rose to 90 percent in 1991, up from the 88 percent rate in 1990. The 1991 slaughter of 327 million surpassed the official 1995 plan target of 320 million head, and is only a little over 30 million short of the 360 million target set for the year 2000. Nevertheless, China's hog slaughter rate continues to be well below the 150 percent rate reported in many developed countries. The increase in China's rate reflects the central government's goal over the last few years of increasing slaughter weight by reducing growth in inventory while increasing slaughter rates. Although slaughter rates have risen, yearend inventory in 1991 was still 2.7 percent greater than in 1990.

China's hog raising sector continues to be dominated by relatively small backyard producers as opposed to larger and more efficient specialized livestock households and commercial operations. Although the number of specialized household and commercial operations continue to grow, the increases in hog inventory outstrip that growth, reflecting the government's limited success at halting growth in backyard producer inventories. Over-abundant supplies and relatively low prices for grain continue to promote expansion of backyard hog production as an outlet for surplus on-farm grain.

### Meat and Feed Output To Rise in 1992

The corn harvest in 1991, the second year in a row with a bumper crop, will ensure relatively stable feed prices for livestock producers in 1992. Therefore, livestock output in 1992 will likely increase from 1991 levels. Although grain prices are expected to remain low in 1992, falling livestock purchase

prices in 1991 will likely reduce the rate of growth in livestock inventory in 1992.

In spite of, or perhaps because of, the relatively limited success of the policy to hold 1991 hog inventory down, the Ministry of Commerce recently promulgated a set of policy initiatives to guide hog production through the remainder of the eighth 5-year plan. These include:

- pressing major metropolitan areas to develop livestock production to 30 percent self-sufficiency with the remainder supplied by rural areas,
- promoting rapid development of livestock production bases in the Northeast corn-surplus provinces,
- reducing the ratio of state hog purchases to free market sales, thereby limiting the state subsidies, and
- promoting the creation of regional (provincial) and national livestock product wholesale markets.

The poultry meat sector will likely see continued rapid growth in 1992. Poultry is more efficient in converting feed to meat than hogs, so the government remains committed to expanding the poultry sector. Poultry meat production will likely see higher growth than pork in 1992. Sheep inventory in 1992 will be flat because of weak demand for domestic wool and only limited acceptance of mutton by China's consumers. Beef and poultry meat output in 1992, on the other hand, will likely grow at a higher rate than either pork or mutton. Government support for the dairy sector and the continuation of the EEC dairy aid project will increase the supply of milk and milk products to urban areas and the food processing industry.

Total manufactured feed output in 1992 will likely rise 1 million tons to 33 million. Under utilization of production capacity continues to be a problem for many mills because of the difficulty of acquiring raw materials from grain surplus regions and because feed sales have slackened because of poor quality. The current annual national production capacity of China's 6,596 feed enterprises is estimated at 60 million metric tons.

The most rapid growth in the feed sector will be near urban areas where most large commercial or specialized household

livestock operations are located. The Ministry of Commerce projects an annual increase in feed output of 7-9 percent between 1992 and 1995. Chronic quality problems plague China's feed manufacturing sector, principally because of government price and marketing controls on enterprise feed sales and mill operations. Quality and capacity under utilization will continue to plague the feed sector until government price and distribution controls are further reduced. On the bright side, the proportion of output of better compound feeds in 1992 will likely increase relative to simpler and less efficient mixed feeds.

To promote the development of the feed manufacturing sector, the central government plans to extend tax exempt status to certain feed mills and actively seek foreign investment and technology. By the end of 1991, over 70 foreign-funded feed processing and other feed-related enterprises were operating (under joint Chinese and foreign management). The increase in modern foreign-funded feed enterprises has reduced the need to import a number of different antibiotics, vitamins, and other feed additives. Poor growth prospects in their domestic market has prompted many of Taiwan's livestock feed companies to explore opportunities in China. Taiwan's presence in China's feed sector is likely to grow rapidly in the next few years, joining the growing number of animal feed companies from Thailand and the United States. See the special article "China's Food Consumption and Production Patterns in the Year 2000: Implications for Trade" for an examination of a number of different scenarios for China's meat consumption and production patterns to the year 2000.

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# China's Trade with Neighboring Countries Since the Early 1980's

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**Abstract:** China's trade with neighboring countries and regions grew more rapidly than total foreign trade during the last decade. Hong Kong has not only emerged as a major trade partner of China, but also played an important role in transshipping China's merchandise to other countries. Japan was China's biggest trade partner until Hong Kong took over the position in 1987. China's trade with South Korea and Taiwan also rose markedly in the late 1980's. The country has established close agricultural trade ties with neighboring countries since the mid-1980's and replaced part of the U.S. agricultural commodities exported to these countries. China's export of agricultural commodities is expected to continue in the 1990's, although, as in the past, volume will likely fluctuate, depending on domestic production. China's overall trade with neighboring countries will likely continue to increase but at a slower pace.

**Keywords:** China, trade, imports, exports, commodity trade, re-exports, and policy.

China's foreign trade with neighboring countries and regions grew 20 percent per year between 1983 and 1991, 30 percent more rapidly than the annual average growth rate of 15 percent of overall foreign trade. As a result, the share of trade with neighboring countries as a percent of worldwide trade increased from 44 percent in 1983 to over 61 percent in 1991, for an average annual growth of 4.2 percent. Over the same period, Hong Kong not only emerged as a major trading partner, but also a crucial stepping-stone for transshipping China's imports and exports. Based on China's customs statistics, Japan was China's number one trade partner until 1986; Hong Kong replaced Japan to become China's biggest trade partner in 1987.

China's agricultural trade, particularly exports, with neighboring countries and regions also grew, but this growth was not as stable as the overall trade growth during the last 10 years. The unsteady agricultural trade can be attributed largely to China's annual variations in agricultural production, particularly grain, oilseeds and cotton. In spite of fluctuations, China has continued to export these agricultural commodities to neighboring countries since the mid-1980's and has maintained competitiveness with the United States.

In the 1990's, China's total trade with neighbors is expected to continue expanding rapidly and Japan will continue to be important. Hong Kong is also expected to remain as an important stepping-stone for trade with neighboring countries; this was true before China's official establishment of trade relations with South Korea in April 1992, and is currently true for China-Taiwan trade. China's trade with South Korea and Taiwan, the two fastest growing trade partners in the late 1980's, is expected to continue expanding regardless of their political relations.

## Development of Trade with Neighboring Countries

According to China's customs statistics, two-way trade with neighboring countries increased from \$19.3 billion in 1983 to \$83 billion in 1991, an average increase of 20 percent per year (neighboring countries and regions include the former USSR,

Mongolia, Japan, North Korea, South Korea, Taiwan, Hong Kong, Macao, Vietnam, Laos, Burma, Nepal, Pakistan, India, and Afghanistan). This annual growth rate was significantly higher than the 15.2 percent for China's total trade.

Because of the rapid expansion of trade values, the share of China's trade with neighbors compared with its trade with all countries, in value terms, grew from 44.2 percent in 1983 to 61.2 percent in 1991. In general, prior to the mid-1980's the rapid growth of trade with neighbors was generated by increases in imports from Japan, Hong Kong, and India and in exports to the former USSR. After the mid-1980's trade growth occurred because of rapid import increases from South Korea, Taiwan, and Mongolia and because of exports to South Korea, Taiwan, Hong Kong, Vietnam, Laos, Burma, and Nepal (table 1).

According to China's customs statistics, which count imports and exports according to the country of origin and first destination of goods, Japan was China's number one trade partner until 1986. Hong Kong then took over the position in 1987. The third most important trade partner of China was the former USSR. Trade between China and the former USSR has developed rapidly since the early 1980's and accelerated following the signing of a long-term grain trade agreement in 1985. Transactions between the two countries, mostly taking place along the Heilongjiang and Xinjiang borders, were mainly barter trade. The shift from barter to cash trade, agreed upon by both countries in 1991, reportedly has not slowed down China's border trade with the former USSR.

The rapid development of trade with neighboring countries and regions can be attributed largely to China's policy changes that have been implemented since the early 1980's. These include the "open door" policy to the outside world, rapid domestic economic development, a return to the natural economic territory trading since the end of the cold war and confrontations with border countries, lower prices because of lower shipping costs, and relaxed trade restrictions with South Korea and Taiwan. China's customs statistics show that trade with South Korea and Taiwan has grown markedly since the late 1980's, despite only 3 years of available official trade statistics. However, external (re-export) trade statistics published by the Hong Kong Census and Statistics Department show that the value of Hong Kong's transit trade between

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Table A-1--China's trade with neighboring countries or regions, 1983-91

Country	1983	1984	1985	1986	1987	1988	1989	1990	1991
Million U.S. Dollars									
Total:	19,258.1	26,071.4	36,033.9	36,295.4	42,476.8	53,946.5	61,805.3	68,004.8	83,092.0
Former USSR	763.0	1,327.0	1,978.0	2,639.8	2,518.7	3,257.8	3,996.0	4,379.1	3,904.3
Mongolia	4.3	4.5	6.3	13.1	24.9	24.9	28.5	41.0	46.0
Japan	10,055.6	13,921.6	21,144.0	17,218.0	16,472.5	18,938.4	18,928.6	16,599.0	20,283.1
N. Korea	530.0	529.9	488.4	509.3	513.3	579.0	561.9	482.7	610.5
S. Korea	--	--	--	--	--	--	898.2	1,943.5	3,244.9
Taiwan	--	--	--	--	--	--	1949.9	2,574.6	4,233.9
Hong Kong	7,539.4	9,863.8	12,003.0	15,394.3	22,214.6	30,240.8	34,456.3	40,904.5	49,600.3
Macao	285.1	355.3	302.8	396.0	536.3	588.4	615.0	666.8	697.9
Vietnam	0	0	0	.1	.1	.9	8.0	7.2	32.2
Laos	4.6	5.5	9.6	9.8	11.3	20.8	16.3	16.2	13.4
Burma	47.6	47.9	82.0	95.4	163.7	270.7	313.7	343.0	392.1
Nepal	28.4	16.0	19.8	19.6	21.6	24.7	32.8	47.1	33.6
Pakistan	384.6	322.9	245.1	231.6	337.7	385.1	592.5	584.9	687.3
India	73.8	64.1	123.9	127.5	117.5	246.3	271.2	264.1	264.8
Afghanistan	7.7	8.2	18.0	69.6	24.0	25.0	11.4	22.6	27.1
Imports:	7,976.3	12,519.0	21,185.0	19,919.3	20,239.2	25,338.8	27,992.5	27,352.2	34,678.3
Former USSR	442.5	711.0	982.3	1,440.0	1,271.6	1,782.1	2,146.7	2,139.9	2,080.9
Mongolia	2.1	2.3	2.0	3.8	4.6	7.9	8.7	11.2	20.1
Japan	5,519.4	8,503.7	15,035.0	12,438.6	10,074.2	11,036.1	10,533.9	7,588.0	10,031.6
N. Korea	255.4	288.7	256.9	276.0	236.1	233.7	184.6	124.6	85.7
S. Korea	--	--	--	--	--	--	426.2	684.0	1,066.2
Taiwan	--	--	--	--	--	--	1,856.4	2,255.0	3,639.0
Hong Kong	1,717.4	2,952.1	4,797.3	5,609.8	8,436.8	11,973.7	12,540.4	14,254.4	17,463.1
Macao	15.9	35.3	53.7	80.4	109.0	146.4	146.0	160.9	171.5
Vietnam	--	--	--	.1	.1	.8	5.6	3.4	10.8
Laos	4.6	5.5	9.6	9.8	10.7	17.8	12.7	6.2	2.2
Burma	15.9	15.6	45.8	57.6	95.1	137.1	126.1	119.5	105.9
Nepal	2.8	4.5	2.4	3.4	1.1	3.0	5.3	5.2	1.4
Pakistan	159.9	51.1	57.9	24.9	38.0	55.2	224.4	90.1	89.2
India	15.4	26.0	38.8	38.5	29.7	97.7	102.5	97.3	120.3
Afghanistan	.3	.1	.3	.3	.1	.1	.3	.2	1.5
Exports:	11,281.8	13,552.4	14,848.9	16,376.1	22,237.6	28,607.7	33,812.7	40,652.6	48,413.7
Former USSR	320.4	615.9	995.7	1,199.8	1,247.1	1,475.7	1,849.3	2,239.2	1,823.4
Mongolia	2.2	2.2	4.3	9.3	20.3	17.0	19.9	29.8	26.0
Japan	4,536.1	5,417.9	6,109.0	4,779.5	6,398.3	7,902.3	8,394.7	9,011.0	10,251.6
N. Korea	274.6	241.1	231.5	233.4	277.1	345.3	377.4	358.2	524.8
S. Korea	--	--	--	--	--	--	472.0	1,259.5	2,178.7
Taiwan	--	--	--	--	--	--	93.5	319.7	594.8
Hong Kong	5,822.0	6,911.7	7,205.7	9,784.6	13,777.7	18,267.0	21,915.9	26,650.1	32,137.2
Macao	269.2	320.0	249.0	315.6	427.3	441.9	469.0	505.9	526.3
Vietnam	--	--	--	--	0	.2	2.4	3.9	21.4
Laos	0	0	0	0	.6	3.0	3.7	10.0	11.2
Burma	31.7	32.3	36.3	37.8	68.7	133.6	187.7	223.5	286.2
Nepal	25.6	11.4	17.5	16.2	20.5	21.7	27.5	41.9	32.2
Pakistan	224.8	271.8	187.2	206.7	299.8	330.0	368.1	494.8	598.1
India	58.5	38.2	85.1	89.0	87.8	148.6	168.7	166.8	144.5
Afghanistan	7.5	8.1	17.7	69.3	23.9	25.0	11.1	22.4	25.6

-- not available

Sources: China Statistical Yearbook, 1986; China's Customs Statistics, 1986-88, 1990; and China's Customs Statistics, 1991, No. 1 (Quarterly Issue).

Table A-2--Hong Kong external trade (re-exports), 1979-91

Country	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Million U.S. Dollars													
From China:	1,132	1,687	2,296	2,421	2,709	3,595	4,445	6,615	10,806	16,849	24,138	30,863	40,623
U.S.A.	147	340	503	589	758	1,123	1,445	2,393	3,558	5,540	8,461	10,481	13,377
Japan	141	118	203	148	153	273	370	420	727	1,440	1,922	2,056	2,678
Taiwan	56	79	76	90	96	128	116	144	289	478	587	766	1,130
S. Korea	--	--	74	94	123	185	249	377	650	840	909	845	976
W. Germany	38	80	59	69	55	89	142	246	562	954	1,546	2,742	3,847
Indonesia	136	201	228	251	224	195	165	230	--	--	--	--	--
Singapore	100	120	147	156	163	151	157	204	263	358	429	498	--
Macao	22	45	62	49	47	55	--	--	--	--	--	--	--
Australia	29	43	60	58	66	100	93	140	243	390	573	629	831
Switzerland	37	42	--	--	--	--	--	--	--	--	--	--	--
Philippines	27	34	--	--	--	--	57	82	--	--	--	--	--
Panama	18	38	--	--	--	--	--	--	--	--	--	--	721
Nigeria	47	88	102	88	--	--	--	--	--	--	--	--	--
Saudi Arabia	--	--	47	81	111	97	109	129	--	--	--	--	--
Canada	--	--	42	46	64	86	110	153	271	419	637	765	1,018
U.K.	--	--	--	--	44	61	86	156	371	652	1,003	1,386	1,701
Italy	--	--	--	--	--	--	--	--	190	400	552	695	951
France	--	--	--	--	--	--	--	--	179	333	509	737	1,078
Netherlands	--	--	--	--	--	--	--	--	170	318	441	678	866
China	--	--	52	91	136	270	395	541	793	1,144	1,548	1,803	2,112
Other	333	461	641	611	669	783	951	1,401	2,541	3,584	5,021	6,341	9,336
To China:	263	933	1,439	1,317	1,677	3,590	5,907	5,243	7,716	12,157	13,268	14,238	19,729
Japan	73	182	263	273	467	1,213	1,867	1,143	1,658	2,968	3,008	3,195	4,633
U.S.A.	26	68	101	170	203	375	575	567	792	1,228	1,316	1,320	1,712
Taiwan	21	242	390	208	169	426	988	811	1,227	2,241	2,897	3,283	4,684
Switzerland	8	24	34	25	0	0	0	0	--	--	--	--	--
S. Korea	--	--	145	56	45	160	355	276	538	1,224	1,000	969	1,374
W. Germany	--	--	--	--	168	201	137	133	173	288	333	357	523
U.K.	--	--	--	--	--	--	120	118	--	--	249	260	309
Italy	--	--	--	--	--	--	98	81	--	--	--	--	--
France	--	--	--	--	--	--	--	--	--	--	--	--	--
Indonesia	--	--	33	42	--	--	--	--	117	208	--	--	--
Singapore	--	--	26	27	--	--	--	--	107	223	493	416	607
China	--	--	52	91	136	270	395	541	793	1,144	1,548	1,803	2,112
Other	135	417	394	426	490	945	1,372	1,572	2311	2,634	2,424	2,635	3,777

-- not available

Sources: Hong Kong External Trade, 1979-91; and annual exchange rates are from International Financial Statistics.

China and Taiwan was much larger than published by China's Customs Administration (table 2). The statistics indicate that Hong Kong has played an important role in China's indirect trade with Taiwan during the last decade.

### Hong Kong's Role in China's Foreign Trade

During the last decade, Hong Kong clearly served not only as China's stepping-stone to Taiwan, but also with many other countries, especially for exports. According to the Census and Statistics Department of Hong Kong, the value of Hong Kong's

re-exports, or transshipments to and from China, grew from \$1.4 billion in 1979 to \$60.4 billion in 1991, an average annual increase of 36.8 percent. The transit trade stems from Hong Kong's status as a free trade area, sophisticated harbor facilities, well developed financial and banking network, and closeness to the concentrated area of joint ventures in south China.

Because of China's increasing trade through Hong Kong, users of China's trade statistics should be cautious in studying China's trade with neighboring countries and regions. Those statistics need to be at least partially adjusted by the re-export trade

**Table A-3--Hong Kong imports and re-exports, 1981-91**

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Million U.S. Dollars											
Imports from China (A)	5,318	5,455	5,820	7,100	7,449	10,252	14,775	19,406	24,432	29,525	36,710
Re-exports to other countries (B)	2,296	2,421	2,709	3,595	4,445	6,615	10,806	16,849	24,138	30,863	40,623
% of B/A	43	44	47	51	60	65	73	87	99	105	111
Imports from other countries (C)	24,757	23,541	24,148	28,571	29,705	35,364	48,466	63,899	72,152	82,485	100,240
Re-exports to China (D)	1,439	1,317	1,677	3,590	5,907	5,243	7,716	12,157	13,268	14,238	19,729
% of D/C	6	6	7	13	20	15	16	19	18	17	20

Sources: Hong Kong External Trade, 1981-91; and annual exchange rates used are from International Financial Statistics.

statistics published by the Hong Kong government, particularly for Taiwan. While direct trade with mainland China is still officially banned by Taiwan's government, the value of indirect trade was probably over \$4 billion in 1990 and more than \$5.8 billion in 1991 as indicated by transit trade statistics compiled by the Hong Kong government. The transit trade value is over 57 and 37 percent higher than the total trade value of \$2.6 billion for 1990 and \$4.2 billion for 1991, respectively, as published by China's Customs Administration (table 1). Actual trade was probably much higher than shown by the transit trade value because of a significant amount of smuggling across the Taiwan Strait.

As to the value adjustments of China's trade with other neighboring countries, it mainly depends upon how the trade statistics are compiled. Trade statistics compiled by the Japanese government, for example, also show significant differences from those of China, although the discrepancies were not as large as those found between China and the United States (5). Hong Kong's 1990 and 1991 re-export trade, which showed more than \$2 billion of merchandise originating from China and re-exported to Japan, for example, could account for the majority of the discrepancy between the export and import values as published by the governments of China and Japan.

The adjustment of trade statistics discrepancies between China and other countries will not be discussed in this report. The recalculation can be quite complex. However, for 1979 through 1991, the values of China's transit trade to other neighboring countries by way of Hong Kong are shown in table 2.

In reality, the rapid growth of China-Hong Kong trade can be divided into a moderate increase in direct trade with Hong Kong and a drastic expansion of transit trade. As shown by the statistics compiled by Hong Kong government publications, the share of re-exports originating from China to the value of Hong

Kong's total imports from China increased from 43 percent in 1981 to 99 percent in 1989 (table 3).

For 1990 and 1991, Hong Kong's values of re-export originating from China were larger than its own imports from China. A portion of the re-export value is possibly attributed to carryovers from yearend stock changes of the previous years. But, a more reasonable explanation is that products originally manufactured in China and exported to Hong Kong were partially reprocessed in Hong Kong. The value-added products were then exported to other countries in 1990 and 1991, creating the situation where there were larger re-exported values than total imports from China. This explanation may also explain some portion of the changing discrepancies between China's trade and Hong Kong's re-export statistics (tables 1 and 2).

Similarly, the value share of re-exports to China relative to Hong Kong's total imports from other countries rose from 6 percent in 1981 to between 15 and 20 percent during the late 1980's and the early 1990's (table 3). This also indicates that an increasing number of countries used Hong Kong as a conduit to China in the 1980's. Again, the increased transshipments through Hong Kong is primarily attributed to its unique relationship with China.

### **Agricultural Trade with Neighboring Countries**

Along with the growth in overall trade, China developed closer agricultural trade relationships with neighboring countries, particularly after its record high agricultural production in the mid-1980's. Since implementing the open door policy at the end of the 1970's, China began relaxing restrictions on importing agricultural commodities such as wheat, corn, soybeans, and cotton, mostly from the United States, Canada, and Australia.

Since the mid-1980's, China has substantially reduced corn, soybean, and cotton imports, but has become a major grain, particularly corn and soybeans (classified as a grain), and cotton exporter, competing with U.S. agricultural exports in the regional markets. China's agricultural exports to neighboring countries have been competitive because of proximity, quality (possibly due to manual processing), and lower prices in many cases.

China has continued exporting corn, soybeans, and cotton since 1985 and has become a major competitor of the United States, Canada, and Australia in certain markets. The exports are not expected to continue in the long-run largely because of population growth and increased domestic demand due to higher income. The quantity of those commodities exported declined as crop production stagnated during the second half of the 1980's. More importantly, most exported commodities have been shipped mainly to neighboring countries, for example, the former USSR, Japan, Hong Kong, and North Korea. By the end of the 1980's South Korea began to pick up more corn and both Taiwan and South Korea bought small quantities of cotton as well. A report from South Korea revealed that the country's major source for corn and raw cotton imports has changed from the United States to China since 1990 (3).

Based on China's customs statistics, China's corn sales in the second half of the 1980's have largely been shipped to neighboring countries, especially Japan and the former USSR. However, the share of corn exports to neighboring countries declined from 92 percent in 1986 to 64 percent in 1990 (figure A-1). The drop resulted mainly from the loss of the former USSR as a market after the expiration of the Sino-USSR 1985-89 trade agreement. The agreement had called for annual corn and soybean shipments to average 1.5 million and 500,000 tons, respectively. The former USSR stopped importing China's corn, but resumed corn purchases in 1991.

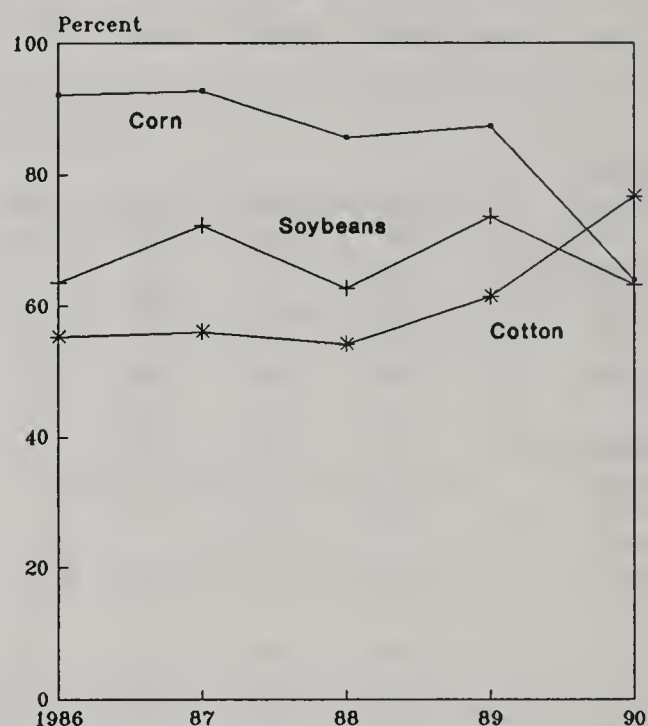
Since 1986, the volume of soybean sales to neighboring countries has ranged between 63 and 74 percent of China's total soybean exports. Because of increases in China's domestic demand for soybean products and soybean meal in recent years, the quantity of soybean and by-products exported has declined.

Cotton exports to neighboring countries have followed a pattern similar to corn and soybeans. The share of cotton exports to neighboring countries has generally been on an upward trend, increasing from 55 percent in 1986 to about 68 percent in 1990. Meanwhile, the total quantity of sales has been declining. China's cotton output peaked in 1984. But aggressive promotion of cotton exports, together with unexpected increases in domestic mill and non-mill uses during the following 2 or 3 years, depleted stocks rapidly. Cotton exports were then squeezed as production stagnated during the late 1980's.

### Trade Prospects with Neighboring Countries

China's trade with neighbors has a bright future. Although slower overall growth is expected, total value of trade with other Asian countries, such as South Korea, Vietnam, and Taiwan should continue to grow rapidly because of improved political and economic relations. Japan will continue to be an

**Figure A-1**  
**Export Share to Neighboring Countries**



Source: China's Customs Statistics

important trade partner because of Japan's investments and China's demand for high technology. China's border trade with the new Russian Republics may not be as steady as in the past few years. Chinese officials in Heilongjiang and Xinjiang, however, continue to report vigorous trade activities. In general, agricultural trade with neighboring countries, in volume terms, is expected to continue to fluctuate as in the 1980's because of annual variations in China's agricultural production and international prices.

China's trade with South Korea is expected to expand rapidly because the two countries are close to formally establishing diplomatic relations. According to China's customs statistics, two-way trade increased from \$217 million in 1981 to over \$3.2 billion in 1991, an increase of 24.5 percent a year. South Korean traders have been aggressively developing markets in China and will likely be successful because of lower tariff rates as a result of the bilateral trade agreement signed in February 1992. In return, China will be able to sell more agricultural and light industry products directly to South Korea. According to the Beijing Representative Office of the Korea Trade Promotion Corporation (KOTRA), Sino-South Korean trade may hit \$10 billion for 1992. For 1991, total trade value reached \$5.84 billion, up 52 percent from the previous year's \$3.85 billion (3). The 1990 KOTRA's trade value for China and South Korea doubles that of China's customs statistics.

China's border trade has developed rapidly with Laos, Nepal, India, and Pakistan. However, total values have been relatively small as compared with Japan, Hong Kong, the former USSR, South Korea, and Taiwan.

In recent years, China has rapidly developed indirect trade with Taiwan through Hong Kong because of the strained political situation. Despite the relatively insignificant amount of

agricultural trade between Taiwan and China, the total, according to Hong Kong statistics, grew from \$466 million in 1981 to more than \$5.8 billion in 1991, an average annual growth of 25.8 percent (table 2).

This rapid growth is expected to continue, although establishing direct trade relations does not look promising in the near future. Taiwanese businessmen have reportedly poured more than \$3 billion into China for various investment projects over the past few years, particularly in Guangdong, Fujian, Shanghai, and other coastal provinces. Most Taiwanese funds have flowed into labor-intensive industries such as textiles, shoe-making, electronics, toys, umbrellas, building materials, chemicals, and machinery.

Large numbers of Taiwanese tourists have surged into China since 1987, the year Taiwan's government began to allow its citizens to visit their relatives in mainland China. Taiwanese traveling in China not only spend money buying specialty products, but also send money and gifts to relatives. A conservative estimate indicates that Taiwanese tourists have spent about \$2 billion a year the last 2 or 3 years.

### Hong Kong's Role in China's Future Trade

As discussed above, Hong Kong's transshipment role in China's trade has become significant over the last few years. Because of its geographical position adjacent to south China's joint ventures area, one could conclude that transit trade would likely continue, at least for the rest of the 1990's. However, Hong Kong's future as conduit for China's trade with neighbors is expected to change dramatically as a result of the coming official diplomatic relationship with South Korea, improving economic relations with Taiwan, and Hong Kong's return to China. Nevertheless, many economists based in Hong Kong also argue that Hong Kong's role in China's trade would not change significantly because of its well-developed services and infrastructure and because of the rapid development of south China and Hong Kong itself.

China's leaders have continuously promised the people of Hong Kong and the rest of the world that after control returns to China, Hong Kong will be allowed to keep its current capitalist system for 50 years (or the "one country, two system" policy). China, however, has also begun to participate in important decisions regarding Hong Kong's long-term development for the future. For example, it has expressed its concerns over the budget and expenditures for the planning and construction of the new airport in Hong Kong.

During the last few years, China has also increased its investment in Hong Kong. With the promises by its leaders and China's gradual increase in participation in Hong Kong

political and economic decisions, some prominent Hong Kong investors and others have begun to curtail investment and move some financial assets out of the territory. Although most Hong Kong residents have no choice but to stay after 1997, others are prepared to wait but are hedging their bets by holding or applying for immigrant visas for the United States, the United Kingdom, Canada, and Australia, so they can leave if the situation after 1997 deteriorates.

Taiwan's economic relations with China have improved rapidly in recent years, and the substantial growth of two-way trade across the Taiwan Strait reflects this. Assuming that political problems can be resolved and direct trade can be established, the total volume of transit trade through Hong Kong could be significantly reduced. In addition, the diversified and increased investment by Taiwanese and South Korean businessmen may also compete with Hong Kong, posing a great challenge to Hong Kong's future investment role in China.

Will China be able to maintain Hong Kong's transit trade status after 1997 as China's foreign trade continues to grow? China's policy towards Hong Kong will not only affect Hong Kong's citizens, economy, and trade, but it will also have an effect on Taiwan's willingness to come to terms with Mainland China. China is also well aware that a stable and economically prosperous Hong Kong, particularly after 1997, would greatly benefit the future economic development of South China. However, whether a successful and prosperous Hong Kong with a capitalist system would create conflict with China's political ideology, and therefore force China to forego its promises a few years after 1997, remains to be seen.

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# China's Barley: An Analysis of Production, Consumption, and Trade

Frederick W. Crook\*

**Abstract:** China is a major barley producer and importer. Newly released data enabled USDA analysts to re-estimate China's barley area, yield, and production numbers. Barley area and production have declined more rapidly than previously estimated. In earlier decades barley was an important food crop but in the last decade it has been used primarily for feed and brewing stock. Incomes rose sharply in the 1980's and beer demand skyrocketed. Since demand for high quality brewing barley exceeded domestic supplies, imports reached 977,000 tons in 1990/91. China's agronomists hope to raise the supply of domestic brewing barley but the outlook is for continued imports in the 1990's.

**Keywords:** China, barley, production, consumption, trade, and beer.

## Introduction

For several millennia barley was an important grain crop in China. Some agronomists even believe the Tibetan plateau was the home of all modern barley strains. This grain is used for food, feed, and as stock for beer. Barley output in 1991 is estimated to be about 3.9 million tons, compared with 96 million for wheat and 183 million for paddy rice. Among coarse grains it ranks well behind the 1991 99-million-ton corn crop but is roughly comparable with sorghum and millet crops.

Before reforms were instituted in the late 1970's barley was an important food grain. Urban and rural incomes rose during the reform decade of the 1980's and citizens reduced consumption of barley as a food grain. At the same time rising incomes shifted consumer preferences to more beer and red meat. The demand for barley as a feed stock for beer and as a feed for livestock exceeded domestic supplies by the late 1980's and China began to import barley. China's economy will continue to expand, incomes will rise, consumers will demand more beer and meat, which in turn will increase barley demand. In the coming decade prospects are good for continued imports.

The purpose of this article is to describe primary growing areas and policies affecting China's barley production, consumption, and trade. New data from the Ministry of Agriculture were the basis of USDA's recent revised estimates of barley area, yield, and production. The methodology used to re-estimate China's barley numbers is briefly explained. China's supply and use table shows production, imports, stocks, total consumption, and feed use. It also describes the growth of China's beer industry and explores the growing demand for brewing quality barley.

This article is based on materials gathered on trips to China from 1988-91 during which the author interviewed national and provincial agricultural officials. Articles from newspapers, transcripts from radio broadcasts, and books published in Chinese and English were used to prepare this report.

## Barley Cultivation

Agricultural historians note that there is evidence that barley has been cultivated in China for about 5,000 years. Even

before Qin and Han dynasty times (circa 250 B.C.) barley was a major grain crop in the north China plain area. Some agronomist believe the Tibetan plateau to be the home of barley (26, 17). Barley area in 1991 has been estimated at 1.2 million hectares and accounted for 4.4 percent of China's coarse grain area, more than oats (2.1 percent), about the same as sorghum (5.1 percent), less than millet area (8.2 percent) and well behind corn (79.9 percent). Barley yields in 1991 were estimated to have been 3.2 tons per hectare compared with 4.58 tons for corn, 3.5 tons for sorghum, 1.8 tons for millet and 1.1 tons for oats. Barley production for 1991 is estimated to be 3.9 million tons compared with 99 million for corn, 4.9 million for sorghum, 4 million for millet and 650,000 tons of oats.

## Growing Areas

Scientists in China recognize three barley growing regions. First, there is the highland region which includes Tibet, Qinghai, and parts of Sichuan, Yunnan, Gansu, and Xinjiang provinces (17, 18, 26). The highland variety is hull-less barley, called "Qingke" by Tibetans. It has a short growing season, is cold resistant (table B-1), and is the only grain farmers can grow at elevations above 4,500 meters. Qingke accounts for about 64 percent of Tibet's total annual grain production (20).

Second, the northern spring barley growing region includes provinces in the northeast: Heilongjiang, Jilin, and Liaoning; Inner Mongolian Autonomous Region; Ningxia; parts of Xinjiang; Gansu; Shaanxi; Shanxi; and Hebei. The crop is planted in the spring and harvested in July and August. Most farmers in this region plant hulled barley (17). Note that most provinces did not include barley data in their 1989 statistical yearbooks. Xinjiang reported 31,000 hectares of barley and output of 60,000 tons (a yield of 1,935 kg per hectare) (24).

The third region is the southern winter barley growing region which can be divided into five sub-regions. For selected provincial barley statistics see table B-2. The middle and lower reaches of the Yangzi River includes Jiangsu, Shanghai, Zhejiang, Anhui, Jiangxi, Hubei, and Hunan. The crop is sown in the fall and harvested the following spring. Farmers sometimes prefer to plant winter barley rather than winter wheat because barley matures a few weeks earlier which gives farmers a better chance to grow other grain and economic crops. A large portion of China's malting barley is raised in this sub-region. The lower Yellow River basin sub-region includes

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Table B-1--Highland barley in Tibet and Qinghai provinces

Years	Tibet			Qinghai		
	Area	Yield	Prod	Area	Yield	Prod
	1,000 hectares	Kgs/ha	1,000 tons	1,000 hectares	Kgs/ha	1,000 tons
1973	--	--	230	--	--	--
1974	--	--	268	--	--	--
1975	--	--	236	--	--	--
1976	--	--	242	--	--	--
1977	--	--	255	--	--	--
1978	--	--	245	--	--	--
1979	--	--	206	--	--	--
1980	106	2,236	237	--	--	--
1981	114	2,436	278	--	--	--
1982	118	2,212	261	--	--	--
1983	116	1,750	203	--	--	--
1985	113	2,956	334	--	--	--
1986	121	2,347	284	90	2,000	180
1987	121	2,397	290	89	1,719	153
1988	119	2,723	324	86	1,860	160
1989	--	--	--	88	1,943	171

-- = data not available

Sources: Qinghai Sheng Shehui Jingji Tongji Nianjian, 1988; and Xizang Shehui Jingji Tongji Nianjian, 1989.

the provinces of Shandong, Hebei, and Henan; and parts of Shanxi, Shaanxi and Gansu. The south China barley sub-region includes Fujian, Guangdong, and Guangxi. The high land barley sub-region includes Yunnan and Guizhou provinces. The fifth barley sub-region includes the Sichuan basin (17).

### Production Policy

After the 1949 revolution, a central government objective was to provide adequate food grain rations for a rapidly growing population. Authorities promoted the production of food grains such as wheat, rice and corn, which had relatively high unit yields. Even though barley yields are comparable with those of wheat, the milling, food, and taste properties made it a less desirable food grain.

While making annual grain production plans, central authorities did not expand area sown to barley. Similarly, central authorities allocated funds to develop high yielding strains for wheat, rice, and corn. Also the Grain Bureau did not procure barley with the same zeal as wheat. It was one of the miscellaneous grains which the government freed from controls, and from the mid-1980's, production of barley depended on demand in local free markets, contracts with enterprises acting for major breweries, and farm self sufficiency.

Plant breeders research budgets have been allocated to improve yields of the primary grain crops. But beginning in the 1980's

the Ministry of Agriculture and Zhejiang province organized a team to improve barley varieties. In 1982, because of the growing demand for brewing barley, a national meeting was sponsored by the Ministry of Light Industry (Institute of Fermentation) and the Chinese Academy of Agricultural Sciences to investigate ways to improve brewing barley quality (12). In 1983 the same institutions set up a base to produce improved barley varieties. During the seventh 5-year plan (1986-90), the issue of improving barley varieties was raised to the national level. Institutes involved in the work include the Agricultural Institute in Zhejiang, the Genetics Institute of the National Academy of Sciences, the Barley Improvement Team of the Fermentation Institute, Ministry of Light Industry, and the agricultural institutes of 10 provinces (13). In 1984, a national conference was held in Beijing to discuss barley production and a Chinese Barley Science Society was established (17).

Table B-2--Southern winter barley producers: area and production, 1979-90

	Jiangsu	Zhejiang	Fujian	Shanghai
	1,000 hectares			
1979	540	--	--	--
1980	--	--	--	74
1981	--	--	--	--
1982	--	--	--	--
1983	517	--	--	79
1984	480	--	--	95
1985	500	244	111	79
1986	--	--	107	58
1987	--	--	134	62
1988	--	266	--	--
1989	--	227	--	--
1990	--	244	--	--
	1,000 tons			
1979	2,005	--	--	--
1980	1,925	--	--	--
1981	--	--	--	--
1982	--	--	--	--
1983	1,900	--	--	--
1984	--	--	--	--
1985	1,750	666	216	--
1986	--	--	--	193
1987	--	--	--	271
1988	--	865	--	--
1989	--	687	--	--
1990	--	769	--	--

-- = no data available.

Sources: Crook, Frederick W. China's Coarse Grains: Production, Area and Yield Estimates, 1949-85, p. 13; Fujian Tongji Nianjian, 1988, pp. 150-153; Shanghai Tongji Nianjian; and Zhejiang Tongji Nianjian, 1991, p. 123.

## Malting Barley

In 1984 China's governmental authorities reduced the tax on beer which promoted production and hence demand for malting barley (26). Jiangsu and Zhejiang provinces are the major producers of malting barley. In 1987, the area sown to brewing barley totaled 572,000 hectares, about 45 percent of total area. Brewing barley production totaled 1,415,000 tons or about 38 percent of total output.

Note that brewers in China suggested that it takes 1 kilogram of barley to produce 5 kilograms of beer. In 1990 China produced about 6.7 million tons of beer, which means that brewers used about 1.3 million tons of barley (1). This quantity is roughly parallel to the amount of brewing barley.

Jiangsu and Zhejiang used to provide most of the barley for breweries in Qingdao, Canton, and big cities in the northeast. The two provinces have large populations, limited arable land, and long experience with the benefits of foreign trade and comparative advantage. In recent years several factors have worked against barley production. First, it seems that farmers can make greater profits raising other crops. For example, in 1991 officials in Zhejiang province listed open market prices for various grains and oilseeds as listed in table B-3 (8,2).

**Table B-3--Barley and competing crop prices and returns in Zhejiang**

Crop	1991 Market Prices in yuan/kilogram	1990 Net Returns in yuan/hectare
Wheat	0.77	107.25
Gengdao rice	0.77	926.40
Xiandao rice	0.58 to 0.64	926.40
Corn	0.56 to 0.60	423.75
Rapeseed	1.49	-76.25
Feed barley	0.60	na
Brewing barley	0.80	na

Source: Frederick W. Crook, "China Trip Report 1991."

Second, the very tight cropping schedule in Zhejiang province pushes farmers away from barley. Farmers try to grow three grain crops a year: winter wheat, or winter barley; early rice; and late rice. The difficulty with raising barley in this region is that most of the time the monsoon rains come just about the time the barley crop is ripening. If there is excess moisture and little sunshine, the barley kernels become dark, which affects the brewing quality of beer. Farmers gamble on growing barley--if conditions are very good they can get 0.80 RMB per kilogram, otherwise they have to sell the barley for feed at a substantially lower price.

Zhejiang brewers reported that approximately one-third of their malting barley is obtained from their own province, one-third is shipped in from Xinjiang, and one-third is imported from Australia (8).

## Sown Area and Production Estimates Revised

Given the lack of barley area and production data from 1949 to 1986, ERS analysts conceived a method to estimate missing data. From currently available data they determined that barley figures were included in miscellaneous grain statistics that included a number of grains such as oats, buckwheat, pulses, and other grains. They used pre-1949 data, which specified barley data, to calculate the percentage of area and production in the miscellaneous grain category. They calculated the quantity of grains in the miscellaneous category from 1949 through 1990 and then used the coefficients to compute barley area and production. These calculations were based on the premise that cultivation practices through the decades did not change much (4).

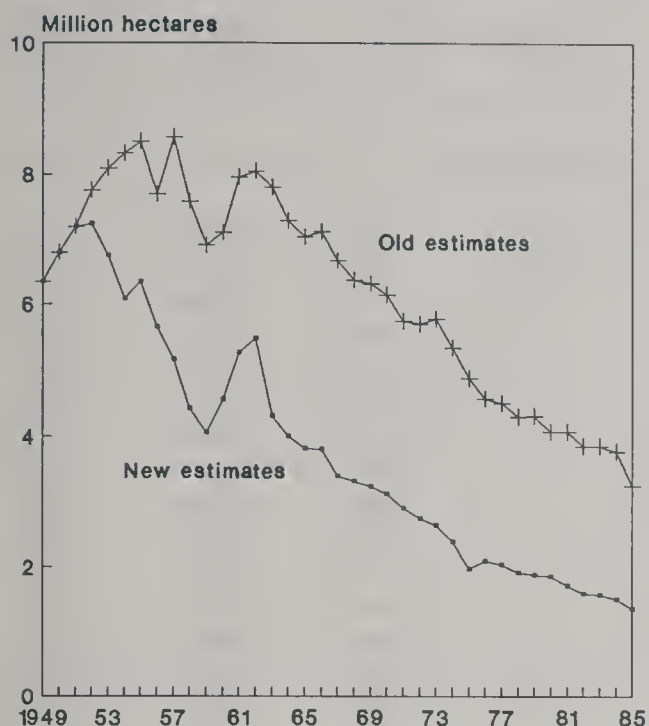
In 1989 the Ministry of Agriculture published *China's Agricultural Economic Statistics Encyclopedia*, which included information on barley area and production (13). Also, in autumn 1990 USDA Agricultural Officers asked Ministry of Agriculture officials to update their barley numbers. These officials reported that the Ministry of Agriculture does not regularly collect or publish barley statistics. But they promised to look into the matter and share available data. In November the Ministry of Agriculture provided barley sown area and production numbers for 1957 and 1987, with the 1987 numbers based on a State Statistical Bureau survey.

The new 1957 and 1987 data points can serve as a foundation to revise the barley series. By dividing these area and production figures by the appropriate miscellaneous area and production numbers, new coefficients can be calculated. The coefficients from the earlier study have continued to be used for 1949 through 1951 because, during that time, the civil war ended, a new administration was being organized, and the land reform program was underway. Beginning in 1951, the barley production coefficient of 0.489 and the area coefficient of 0.415 were gradually reduced to correspond to the 1957 coefficients given by the Ministry of Agriculture. The coefficients between 1957 and 1987 were interpolated. The coefficients for 1987 continue to be used to estimate barley area and production.

This estimating method relies heavily on accurately calculating the miscellaneous grain number which equals total grain minus wheat, rice, corn, sorghum, millet, soybeans, and potatoes. Before re-estimating the barley numbers, all the grain numbers in the data base were evaluated. Since the earlier work was completed, additional data for corn, sorghum, and millet have been published (13). The new statistics were added to the data base before barley estimates were made.

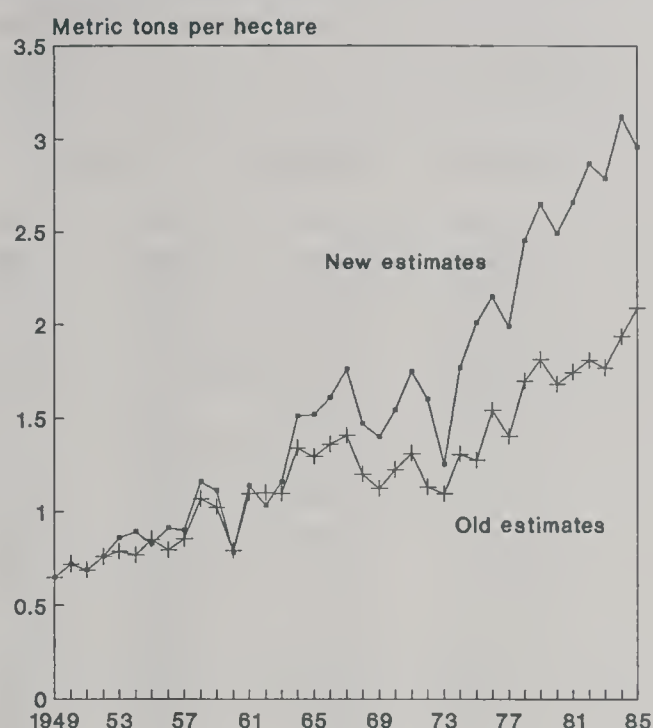
The new area data supplied by the Ministry of Agriculture suggests that area sown to barley fell more sharply than estimated in the 1986 report (figure B-1). As stated previously the primary assumption then was that cultivation patterns had not changed. The new data implies that area fell from a peak of 7.2 million hectares in 1952 to a low of 1.2 million hectares at present. Rather than plant barley, farmers apparently revised cropping patterns to seed more winter wheat and rapeseed. Farmers in barley growing areas in the lower Yangzi River Valley seem to have allocated more land to rapeseed even though net returns per hectare were negative (2). One

**Figure B-1**  
**China's Barley Area Estimates**



possible explanation is that the cost-of-production surveys did not take into account the value of rapeseed as a green manure crop which raised soil fertility for the subsequent rice crop. The new production data suggests the year-to-year variation in output parallels that of earlier estimates, but that output is lower than estimated in 1986 (figure B-2). The new data also suggests that barley yields increased at a more rapid pace after 1960 than noted in the 1986 estimates (figure B-3).

**Figure B-3**  
**China's Barley Yield Estimates**



### Barley Uses

In the early 1950's, T.H. Shen, a noted observer of China's agricultural economy reported that in the previous decade, consumers used 42 percent of barley as food, 33 percent for feed, 15 percent for making maltose, and 10 percent for making beer (18). USDA's first barley supply-and use-table was constructed in 1988 as part of an overall effort to construct such tables for all coarse grains (5,6). The newly revised barley production estimates were entered into the supply and use tables and the same procedures were used to estimate feed use, total consumption, and stocks (table B-4). Distribution of total 1990 barley supply was estimated as: 13.4 percent stocks; 13.6 percent food grains; 47.3 percent feed; and 25.7 percent beer.

### Food Uses Down

Since 1950 there has been a substantial reduction in the use of barley as a food grain. As incomes in urban and rural areas rose, especially in the 1980's, consumers reduced their intake of coarse grains (corn, sorghum, barley, and oats) and increased their consumption of wheat and millet, which is considered a fine grain in north China, and rice.

Barley continues to be used as a food grain in China's northwest provinces and in Tibet. For example, if one assumes that 80 percent of barley in Tibet and Qinghai provinces is used as a food grain, then that would account for at least 10 percent of the total crop. Barley is also used as a cereal grain in the lower Yangzi River Valley. For example, USDA agricultural officers attended an exhibition of products from Yancheng City (a prefectural level city, which is an administrative unit between provinces and counties) in Jiangsu province. Farmers in the rural areas produce barley, which is processed into barley flakes and consumed as a breakfast cereal in a congee--a thin gruel-

**Figure B-2**  
**China's Barley Production Estimates**

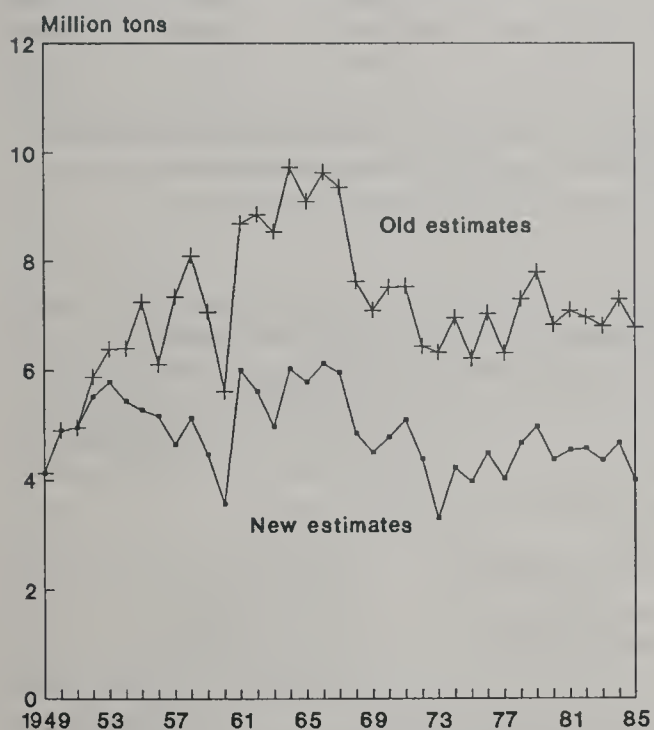


Table B-4--China's barley supply and distribution table, 1960-91

Crop Year	Area harvested	Yield	Production	Beginning stocks	Total imports	Total exports	For feed use	Total consumption	Ending stocks
	1,000 ha	Tons/ha	-----1,000 tons-----						
1960	4,550	0.78	3,559	840	595	17	1,114	4,596	381
1961	5,260	1.14	5,992	381	929	3	864	5,782	1,517
1962	5,475	1.03	5,614	1,517	48	0	716	5,848	1,331
1963	4,298	1.16	4,975	1,331	450	0	1,536	5,363	1,393
1964	3,991	1.51	6,029	1,393	154	0	2,539	6,517	1,059
1965	3,811	1.52	5,785	1,059	31	1	2,416	6,139	735
1966	3,797	1.61	6,123	735	1	0	2,298	5,955	904
1967	3,394	1.76	5,957	904	0	1	2,513	5,782	1,078
1968	3,307	1.47	4,852	1,078	0	1	2,048	4,945	984
1969	3,229	1.40	4,510	984	1	1	1,654	4,557	937
1970	3,113	1.54	4,782	937	0	0	1,176	4,604	1,115
1971	2,902	1.75	5,092	1,115	413	0	1,689	5,302	1,318
1972	2,746	1.60	4,385	1,318	0	0	1,797	4,966	737
1973	2,641	1.25	3,310	737	0	0	1,084	3,247	800
1974	2,385	1.77	4,217	800	0	0	1,083	4,017	1,000
1975	1,972	2.01	3,968	1,000	0	0	954	3,968	1,000
1976	2,094	2.15	4,496	1,000	0	0	1,080	4,496	1,000
1977	2,032	1.99	4,034	1,000	0	0	842	4,034	1,000
1978	1,908	2.45	4,671	1,000	40	0	991	4,611	1,100
1979	1,876	2.65	4,973	1,100	6	0	1,473	4,939	1,200
1980	1,750	2.49	4,365	1,200	9	0	1,814	4,544	1,100
1981	1,711	2.66	4,546	1,100	200	0	2,181	4,746	1,100
1982	1,594	2.87	4,576	1,100	100	0	2,225	4,676	1,100
1983	1,564	2.79	4,361	1,100	100	0	1,951	4,461	1,100
1984	1,501	3.12	4,676	1,100	40	0	2,257	4,716	1,100
1985	1,351	2.96	4,005	1,100	325	0	2,703	4,430	1,000
1986	1,288	2.81	3,613	1,000	520	0	2,420	4,333	800
1987	1,285	2.89	3,717	800	335	0	2,340	4,152	700
1988	1,277	3.28	4,190	700	256	0	2,742	4,446	700
1989	1,268	2.96	3,755	700	600	0	2,520	4,455	600
1990	1,208	3.42	4,137	600	1,000	0	2,393	5,057	680
1991	1,200	2.93	3,516	680	800	0	2,197	4,296	700

<sup>1</sup> Beginning stocks equal barley production divided by coarse grain production times coarse grain stocks. Total consumption equals production + beginning stocks + imports - exports - ending stocks. Feed use equals barley production divided by coarse grain production times coarse grain feed use. Seed use equals the seeding rate times the area for subsequent years. Food consumption equals total consumption - seed - feed.

like mush. Officials at the exhibit reported that Yancheng produces about 10,000 tons of rolled barley a year (9).

### *Barley Feed Use Rises*

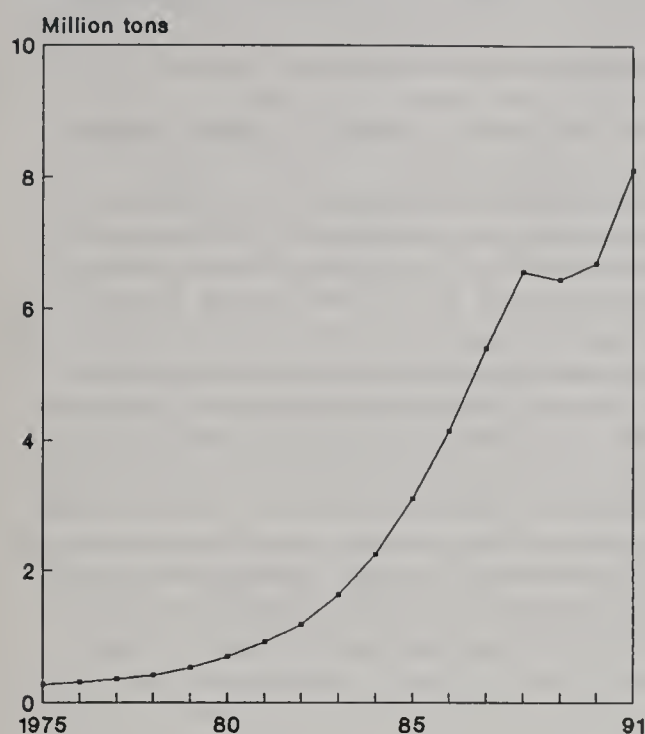
On the grain supply side, China is the world's largest producer. On the use side of the grain balance sheet, China has the world's largest population and also a very large livestock population. When attempting to reconcile supply and use, it has often been difficult to squeeze enough grain out of the supply side to match the demand for food and feed grains. A supply and use table was constructed for total grains and then individual tables were developed for wheat, rice, coarse, and other grains. One of the problems to be solved was how to distribute the coarse grain feed estimate among the five coarse

grains. Millet was treated much like wheat and subtracted from the initial coarse grain feed total. Since there was little information about feed use for corn, sorghum, barley, and oats, it was decided to allocate the remaining feed based on the assumption that the ratio of an individual coarse grain feed use to the revised total would parallel the ratio of its output to the revised total as follows:

$$\frac{\text{barley production}}{\text{revised coarse grain production}} = \frac{\text{barley feed use}}{\text{revised coarse grain feed number}}$$

This procedure showed that by 1990 about 2.3 million tons of barley was fed to livestock, which accounted for about 47

**Figure B-4**  
**China's Beer Production, 1957-1990**



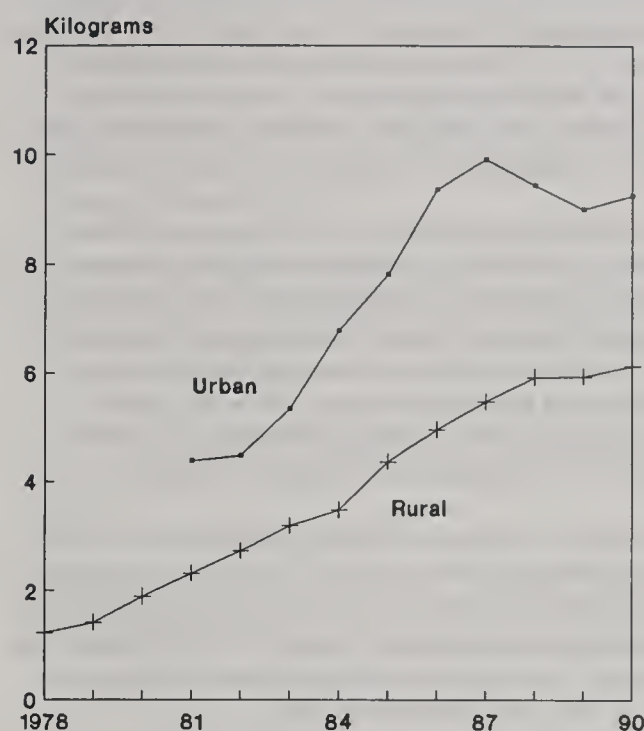
percent of total crop. Zhejiang agricultural officials supported the idea that large quantities of barley are fed to livestock when they reported to USDA officials that most barley in their province was used for feed and malting purposes. They also noted that Zhejiang brewers sell barley dregs to local dairy farms at 70 to 90 yuan per ton. Dairies send their own trucks to pick up the dregs (8). On the other hand officials in Beijing told the 1991 USDA livestock team that very little barley is fed to livestock (11).

#### ***Demand for Malting Barley Rises***

Before World War II China's breweries were concentrated in Qingdao, Shandong, Hangzhou, Zhejiang and Shanghai (18). After the war, beer continued to be produced in these areas and fermentation technology spread to other provinces and cities. Beer production expanded rapidly after economic reforms were initiated in the late 1970's rising from 400,000 tons in 1978 to 8.1 million tons in 1991 (figure B-4). Urban per capita consumption of alcohol (mostly beer by weight) more than doubled from 4.38 kilograms in 1981 to 9.25 kilos in 1990 (figure B-5). Rural per capita consumption nearly tripled from 1.89 kilos in 1980 to 6.14 kilos in 1990 (19,22). Note that in 1990, city dwellers consumed 50 percent more alcohol than their rural cousins--a consumption pattern replicated in many other commodities.

China's most important beer producing provinces are Shandong with 840,000 tons; Zhejiang with 696,900; Liaoning with 549,600; Heilongjiang with 537,600; and Hebei with 500,400 (19). Officials reported that in the past, barley producers in Zhejiang provided most of the malt barley requirements for Shandong breweries, but through the years, farms in Zhejiang province could not maintain quality compared with what Shandong brewers could import from Australia (8) (tables B-5 and B-6).

**Figure B-5**  
**Urban/Rural Per Capita Alcohol Consumption**



**Table B-5--China's barley imports, 1986-90**

Country	1986	1987	1988	1989	1990
1,000 tons					
Australia	42	96	29	176	585
New Zealand	0	21	0	0	0
Canada	157	94	52	70	67
Total	199	211	81	246	652

Source: Summary of China's Customs Statistics, 1986-89 issues.

**Table B-6--China's malt imports, 1986-90**

Country	1986	1987	1988	1989	1990
Tons					
Australia	3,550	11,151	7,627	7,972	1,393
France	800	0	4,293	1,666	200
Germany, FDR	0	206	0	0	0
United States	0	21	4	0	163
Belgium	0	2,524	920	0	2,006
Macao	0	0	0	300	0
Hong Kong	0	0	32	148	2
Total	4,350	13,902	13,988	10,091	3,767

Source: Summary of China's Customs Statistics, 1986-89 issues.

In 1987, small scale malting plants increased in Jiangsu and Zhejiang, numbering over 100 in Zhejiang alone. These plants consume from 400,000 to 500,000 tons of barley a year. But the technology and equipment is low quality and result in a low quality product (23). The barley malt mill in Yancheng is operated by the Ministry of Agriculture and produces about 20,000 tons of malt per year. The product is sold to over 100 breweries and the demand for malt is greater than supply (9).

Zhejiang officials explained that Grain Bureau grain stations use two different methods to purchase barley from farmers. First, in some areas grain stations negotiate purchase contracts with villages and farmers. Second, in other areas farmers who raise barley and want to sell the product to the grain station simply deliver it and settle up accounts. Note that grain stations pay market prices for barley: 600 RMB per ton for feed barley and 800 RMB per ton for brewing barley.

One large Hangzhou brewery normally purchases about 10,000 tons of barley each year. One-third of its barley requirements come from Zhejiang province. The brewery uses its own trucks to bring barley in from local grain stations at 780 RMB per ton. About one-third of requirements are met from Xinjiang, for which they pay 930 yuan FOB Hangzhou.

About one-third of the brewery's barley is imported. They contact a foreign affairs office in Shanghai that specializes in barley imports. Officials from China National Cereal, Oils and Foodstuff Import and Export Corporation (CEROILS) contact other breweries in China and then purchase a whole shipload. The ship makes stops at Dalian, Qingdao, Shanghai, Ningbo, and Guangzhou to drop off barley. In 1990 the brewery paid 956 RMB per ton delivered in Shanghai or Ningbo. Requirements for brewing barley are a 95 percent to 98 percent fermentation rate and 11 percent protein (8).

### Increasing Malting Barley Imports

Barley imports rose rapidly as beer production expanded, increasing from about 79,000 tons in calendar 1980 to an estimated 800,000 tons in 1991. For October/September 1990/91, USDA estimates that barley imports reached 977,000 tons and projects imports will decrease to 800,000 tons for October/December 1991/92. Canada and Australia have become the primary barley suppliers to China (tables B-5 and B-6). China's tariff on barley is 3 percent ad valorem for countries with reciprocal trade agreements. The tariff barrier for barley shipped from countries without most favored nation agreements is 8 percent ad valorem (21). The volume of malt imports is considerably smaller than barley imports.

### Outlook

For the rest of the 1990's, China's economy will be in a state of transition. Prospects are good for continued economic growth and the outlook is also good for continued reform of the economic system. How will barley fit into China's larger economic system if these two assumptions hold true?

Economic growth in the 1990's likely will provide China's citizens with rising incomes. In the 1980's consumers showed a

strong preference for increased beer and meat consumption as incomes rose. These income and consumption patterns have also been observed in Taiwan, Hong Kong, and Singapore. Rising incomes during the 1990's likely will mean an increased demand for barley as a feed to and to brew beer.

The 1990's also likely will be a period of continuing economic reforms. Market and price reforms will make farmers and brewers more conscious of costs, product quality, product substitution, and profit margins. Reform of the foreign trade system likely will more closely link China's domestic economy with international markets. In the 1990's farmers, livestock feeders, brewers, and consumers will be continually adjusting production, consumption, and investments to the changing economic environment. Will the increased demand for barley in China be met from domestic or foreign sources? It is very difficult to tell now because of the immense complexity of the economic adjustments which will take place in the next decade. Given land scarcity in China, especially in the lower Yangzi River Valley where barley is grown for feed and brewing, and where there are many alternative uses for land, labor, and capital, barley imports likely will rise in this decade. The situation certainly merits continued monitoring and analysis.

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# China's Food Consumption and Production Patterns in the Year 2000: Implications for Trade

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**Abstract:** The effects of income growth and price reforms on China's food consumption pattern by the year 2000 are estimated. Trade impacts will depend on how China adjusts its agricultural production to meet changes in food consumption. Two production scenarios are formulated: 1) A base projection in which trend variables are used to project China's agricultural product mix to the year 2001; and 2) a forecast which allows an adjustment in crop production so that feed grain self-sufficiency is maximized. If China's per capita meat consumption increased with the growth in per capita income as Taiwan's did in the 1960's and 1970's, by the year 2001, China will have to import feed grains or livestock products to meet increasing demand for meats.

**Keywords:** Consumption pattern, production pattern, income growth, income elasticity, urban rationing, self-sufficiency, projection, trade, and per capita income.

## Introduction

China is the world's largest producer and consumer of agricultural commodities. It accounts for 20 percent of the world's grain production and 30 percent of pork production. Changes in China's agricultural production and consumption can have a significant impact on world agricultural markets. What happens to China's agriculture is of great interest to the world agricultural community.

The real per capita income growth was very slow in the first three decades (1949-1979) of the People's Republic of China's history. However, the adoption of rural economic reforms in the 1980's has put China's economic development into high gear and per capita income has been growing rapidly. Real per capita income in 1990 was about 4.7 times that of 1952 and about 3.5 that of 1978. Rapid income growth in the last decade and the coming decade will bring dramatic changes in economic structure and consumption patterns.

Reforms in the 1980's brought substantial increases in living standards. Consumption expenditures increased during the last decade, and share of the food budgets declined from 58 percent in 1978 to 54 percent in 1990. Although per capita meat consumption more than doubled during the last 12 years, meat products still account for only 15 percent of the protein in the Chinese diet (1). The remaining 85 percent of the protein intake comes from food grains. Given the current low level of per capita meat consumption, meat demand should expand.

How China affects world agricultural markets in the next decade or two will depend on the adjustment of agricultural supply and demand to income growth and price changes. Income growth should result in higher levels of per capita meat consumption. Demand for feed grain should build with income growth and higher level of per capita meat consumption. Unless the increase in feed grain production is faster than demand, China's exports of feed grains, particularly corn, will

gradually shrink. Our study projected that by the year 2001, China will likely import feed grains to supply indigenous meat production and meat products.

We use Taiwan's experience to assess the impact of income growth on the food consumption pattern. While Taiwan is two or three decades ahead of China in economic development, they share a cultural heritage. This paper will first use Taiwan's consumption data to estimate income elasticities as a guide for projecting changes in China's food consumption pattern in responding to income growth.

Another force likely to shape China's consumption pattern is price reform. Consumption of most agricultural commodities is heavily subsidized for urban residents and rural specialized households. Staples are subsidized even more than non-staple goods. The removal of consumer support policies would affect the total level and mix of consumption. We have estimated what impact income growth and urban subsidies removal will have on the food consumption pattern in 2001. Two scenarios are formulated to project China's agricultural production: one which extrapolates current trends and another which assumes that maintaining agricultural self-sufficiency as the top priority. Impacts on world agricultural trade of changing Chinese food consumption patterns and the trade-off between importing meat products and feed grains are analyzed.

## Using Taiwan's Experience for Projecting China's Food Consumption Pattern in the Year 2000

China's food consumption pattern in the 1980's resembles Taiwan's economic development in the 1950's and 1960's. In the late 1980's, China's grain for direct human consumption was 220 kg per person (1), which matched Taiwan's in the 1950's and 1960's (2). In China, grain includes potatoes, with a weight conversion of 5 kg of potatoes to 1 kg of grain. Per capita meat consumption, excluding aquatic products, was about 19 kg in 1965 in Taiwan. In China, per capita meat consumption was about 18 kg in 1988. The real per capita income growth in Taiwan in the 1960's averaged 10 percent per

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year compared with 6 percent for China in the 1980's. Per capita food consumption, production, productivity, and population for 1988-91 are the base used to project China's food production and consumption to the year 2001.

More than 50 percent of protein intake in Taiwan has come from meat products since 1984. Per capita meat consumption in recent years in Taiwan has reached a plateau of 60 kg. The meat portion of protein intake has also levelled off at 55 percent. Taiwan's per capita meat consumption grew at around 8 percent per year during the 1960's. China's per capita meat consumption grew at over 10 percent a year during the 1980's. If China's preference for meat is similar to Taiwan's, it will take China 27 years to reach Taiwan's per capita meat consumption level at a 5 percent rate of real per capita income growth.

Pork accounted for more than 80 percent of meat consumption in Taiwan's early economic development. This is comparable to China's experience in the 1980's. In Taiwan, the pork share of meat consumption declined to about 50 percent in 1988. For both countries, poultry becomes a more important item in people's diets during the economic development process. Per capita poultry consumption in Taiwan increased about ten-fold over the past 40 years, while China's tripled between 1978-1989.

We use 1965 as the beginning year to estimate income elasticities for Taiwan's major agricultural commodities since per capita income levels and food consumption patterns are comparable to China in 1988. China's per capita income in 1988 was about US\$290 (1075 yuan). Taiwan's per capita income in 1965 was about US\$300 when adjusted for inflation.

### *Income Elasticities*

Income growth has resulted in significant changes in Taiwan's consumption pattern. However, consumption of wheat, which is not a staple in Taiwan, appears to be independent of income growth. In China, wheat is a staple in the central and northern regions, but not in southern China. Since per capita income is growing faster in southern than northern China, we assume the negative income effect in central and northern China is more than offset by the positive income effect in southern China.

Taiwan's wheat income elasticity of 0.2 is used to project wheat demand in the year 2001. Poultry and beef both have income elasticities greater than 1. Pork has an elasticity of 0.50 and rice a negative elasticity of 0.42. The estimated income elasticities for rice, wheat, pork, beef, and poultry from Taiwan's consumption data are used to project the impact of income growth on China's consumption. The income elasticities for corn and soybeans are derived from the higher feed requirements from increasing meat consumption times each share of feed component. The share of corn in China's feed is assumed to be 35 percent, and the share of soybean is 8 percent. We assume the income elasticities for non-feed demand for corn and soybeans are equal to zero in deriving the income elasticities presented in table C-1.

### *Price Elasticities*

Price elasticities for Taiwan's major agricultural commodities are available from a study on Taiwan's consumption patterns

(7). However, the pricing and distribution policies are very different in China and Taiwan. In China, except for on-farm consumption, the distribution of most agricultural commodities has been controlled by the government at very low prices. Recently, the government raised grain coupon prices intending to approach open market prices. The government's role in Taiwan's agricultural market during the last three decades was much less, and the government often taxed consumers to support producers. Therefore, price elasticities estimated from Taiwan's consumption and price data are probably not appropriate for China. This paper uses price elasticities from the ERS SWOPSIM model to estimate the price effect of potential marketing reforms on China's food consumption.

**Table C-1--Estimated income elasticities for selected commodities, Taiwan**

	Rice	Wheat	Pork	Beef	Poultry
Estimated income elasticities:	-0.42	0.20	0.50	1.10	1.14
R square:	0.93	0.38	0.87	0.89	0.95

Source: Basic Agricultural Statistics, (1989 Edition), Taipei, Taiwan.

### **Linkage Between Meat Production and Demand for Feed Grains**

Since corn and soybean demand is derived in large part from meat product demand, income elasticities for corn and soybeans are estimated from the income growth driven changes in meat consumption during 1988-2000. We use the feed-grain-to-meat conversion ratio and corn and soybean's share in manufactured feed to estimate the increases in corn and soybean requirements when incomes are higher. The derived income elasticities are 0.35 for corn and 0.47 for soybeans. For simplicity, the income elasticities for non-feed demand for corn and soybeans are assumed to be zero.

The majority of China's livestock production remains primitive. Manufactured feed, although increasing rapidly since 1985, still only accounted for less than 20 percent of total livestock feed in 1989 (4). The majority of meat comes from backyard production in rural areas or close to big cities. With economic development, the importance of backyard livestock production will continue to decline. In our study, we assume that the increased feed requirements will come from manufactured feed.

The feed-grain-to-meat conversion ratio is assumed to be 4.35 for pork, 8 for beef, and 2.6 for poultry for the increased consumption during the projection period. The coarse grains share of manufactured feed in China is about 45 percent, of which 30 to 35 percent is corn (4). Oilseeds comprise another

10 percent, of which 6 to 8 percent is soybeans. We assign the highest ratio for corn (35 percent) and soybeans (8 percent), because any increase in the coarse grains or oilseeds component are likely to come from these two commodities. An increase in the pork production of 1 million metric tons (mmt) will require an additional 4.35 mmt of manufactured feed. The 4.35 mmt increase in feed would raise the use of corn by 1.52 mmt and soybeans by 348,000 tons.

## **Forces Shaping China's Food Consumption Patterns to the Year 2001**

Relatively low real income growth between 1949 and 1979 and the subsidized and fixed prices for agricultural commodities for urban residents have contributed to the fairly constant food consumption pattern in China. However, we expect food consumption patterns to change dramatically in the next decade or two. During the reforms of the 1980's, per capita meat consumption grew much faster than real income. However, per capita grain consumption has declined in recent years. The income growth in the next decade or two is expected to be higher than between 1949 and 1979. Higher income elasticities for meat and feed grains imply that the demand will increase faster than for rice and wheat.

As a result of the high income growth in the 1980's, per capita grain consumption has declined slightly since 1987 even with price supports. Per capita meat consumption in 1988 had increased to 165 percent of the 1979 level. Even with this increase, China's annual per capita meat consumption is still low compared with world averages. Higher meat consumption will continue with increases in per capita income in the next two decades. If this is met by increasing domestic production, the demand for feed grain will increase. The higher per capita consumption of meats, fruits, and vegetables will cause rice consumption to decrease.

China's urban distribution system is under considerable reform pressure. The amount guaranteed by ration coupons was set in 1955 when grain and edible oils accounted for a very large proportion of the diet. In the 1980's, rationed amounts of grains and low quality pork exceeded real demand despite rising incomes. However, the government still delivers the guaranteed amount of rationed coupons at unrealistically low prices. There is no incentive for consumers to conserve. Consequently, the incentive for China's government to reform its urban distribution system is great. Indeed, the government introduced some reform measures in the urban rationing system during the last 3 years, which will reduce financial burdens and wasteful consumption of grain. Starting May 1, 1991, wheat, rice, and corn prices were raised by about 54 percent, while prices of edible oils increased by 160 percent (5). This was the first time that the government had raised coupon prices since the mid 1960's. Eleven months later the government announced a second increase in coupon grain prices -- 40 percent, starting on April 1, 1992 (6).

Over the last 3 years, the government has implemented price reforms in different ways in separate parts of the country. For example, in Guangdong province, the government compensates urban residents with a cash payment of 13.9 yuan, which is

about 9.5 percent of wage rate, per wage earner each month (3). Guangdong's urban residents are free to use this money to purchase any food or non-food products they choose at their market determined prices. Early in the implementation of this policy change, urban residents in Guangdong still received grain coupons to guarantee the quantity of grain they were entitled to receive. However, by now, the whole coupon rationing system in Guangdong is abolished. Some places, such as the Guanghan experimental area in Sichuan, have eliminated the coupon system altogether and compensate workers in cash. More and more areas are adopting this kind of marketing reform. Together, higher income growth and price reforms will result in a very different food consumption pattern in the next decade than has existed in the last four decades.

Since 1979, the government has significantly increased procurement prices for farm products a number of times. However, urban subsidized prices of grains, edible oils, and pork have been kept artificially low. The price spreads between government procurement and resale prices have become wider and wider. The government cost of providing urban subsidies to make up the price difference between the procurement prices and urban subsidized prices for grains, edible oils and pork has increased from 8 billion yuan (6.3 percent of total government expenditures, US\$5.2 billion, exchange rate: 1 US\$ = 1.55 yuan) in 1979 to over 30 billion (11.1 percent of total government expenditures, US\$7.96, exchange rate: 1 US\$ = 3.77 yuan) in 1989. If urban subsidies and the rationing system were eliminated, the quantity of grain consumed in urban areas would decrease sharply. In this study, we assume that the removal of price subsidies means China's domestic consumers would be facing world market trade prices.

Although the per unit price subsidy of grains consumed in the urban areas is very high (coupon prices of processed products are often less than two-thirds of procurement prices), the aggregate effects of price reforms on national prices are only a fraction of the per unit urban subsidy. Urban rationed grains account for only about 15 percent (or 50 mmt) of total grain use in 1988. Two-thirds of grain production is consumed on-farm and China's government procures about 15 percent of total grain output at negotiated prices for sale to industrial users. Less than 5 percent of grain output is sold on the open market. In our calculation of price effects, we use the domestic procurement prices for rural on-farm consumption. Therefore, the resulting price differentials are much smaller than if we use the urban coupon prices for assessing the value of on-farm consumption. Consequently, our estimates on the effects of price reforms on grain consumption are conservative.

## **Projections of China's Food Production Pattern in the Year 2000**

Faced with a choice of importing feedstuffs or importing meats, China is more likely to import feedstuffs. Imports of corn and soybeans will require less foreign exchange than the higher value meat products and are easier to store and ship. The most important assumption we made in projecting China's food production pattern is that expected higher incomes will mean increased meat consumption, which China is preparing for by increasing production. In addition, two alternatives in

projecting China's crop production pattern in 2000 were studied. First, yield trend variables were used to project each crop's production when holding sown area constant. Second, shifts in land allocation were allowed to occur in order to minimize grain imports, especially corn and soybeans. The result showed that land would shift from rice to corn and soybeans to support the increased domestic meat production.

### *Using Trend Variables to Project Production*

The introduction of the Household Production Responsibility System (HPRS) changed the incentive structure significantly from the old commune system. By linking rewards directly to the value of output produced, the HPRS gave peasants the incentive to improve agricultural productivity. By the end of 1984, about 99 percent of agricultural production came from contracted households. Agricultural productivity during 1979-1984 increased much faster than any other 5-year period in recent history. Using major crop production as an example, yield per hectare in 1979-84 grew at more than 5 percent per year (except for corn), more than double the growth rate in the second half of the 1980's (1). The productivity growth levelled off after full adoption of the HPRS in 1984. Therefore, we used the average yield growth rate between 1988 to 1991 to project crop production to the year 2001 (table C-2).

**Table C-2--Yield growth rate for China's major crops, 1979-90**

Time period	Rice	Wheat	Corn	Soybeans
Average yield 1988-91: Tons per hectare	5.54	3.08	4.26	1.38
Annual growth rate 1988-91: Percent per year	0.73	0.66	2.37	0.81
Projected yield 2001: Tons per hectare	5.96	3.29	5.39	1.50

Source: China Statistical Yearbook, 1991.

### *Reallocation of Sown Area to Minimize Grain Imports*

Over the next 12 years, the demand increase for corn and soybeans is likely to exceed production growth and will require imports to support domestic meat production. Two reasons explain why it is likely China will make adjustments in land use to minimize grain imports. First, maintaining grain self-sufficiency has always been China's top priority. As a result, to encourage production, domestic wheat prices are maintained at a relatively higher level than other crops. Wheat is the only commodity in the study that has a domestic procurement price higher than its international price.

Second, with the size of China's consumption and production, the impact on international trade will be significant with even small changes. Rice consumption is projected to decline as per capita income increases and urban subsidy removed. Unless

China makes adjustments in rice production, the amount of rice available for export would depress world prices sharply. Given the inelastic rice demand in the world market, total foreign earning from rice exports would fall despite large increases to the world markets. On the other hand, the increase in demand for corn and soybean imports would push world prices much higher than the cost of converting from producing rice to corn or soybeans. It would be to producers' advantage to shift rice land to corn and soybeans.

### **Descriptions of Scenarios**

This study formulates four scenarios to show how income growth, price reforms, and production adjustments would affect China's agricultural trade. Assumptions in these four scenarios are summarized in table C-3. The four scenarios are: "no-growth," "trend," "reform," and "self-sufficiency." There are a few assumptions that apply to all four scenarios. For all scenarios, China's population is assumed to grow at 1.25 percent per year between 1988 and 2000. All scenarios assume there will be an increase in domestic meat production to meet the increase in demand, in other words, there will be no increase in meat imports. Feed required to meet increasing domestic meat production would come from formula feed. Real per capita income growth rate is assumed to be 5 percent per year for every scenario except no-growth.

The adoption of the Household Production Responsibility System (HPRS) stimulated agricultural productivity by linking peasants' rewards directly with the total value of output. This, coupled with reforms encouraging investment in township and village enterprises to produce export goods, caused real per capita incomes to grow at a rate of 5.6 percent per year between 1979 and 1989. To be conservative, we assume a slightly lower growth rate of 5 percent between 1988 and 2000 for all scenarios except no-growth. The different assumptions in each of these four scenarios are highlighted as follows.

**No-Growth.** It is assumed that there is no real per capita income growth between 1988 and 2000. The per capita consumption pattern in the year 2000 is the same as in 1988. No price reform is assumed in this scenario. Population growth will cause China's demand for agricultural commodities to rise to a much higher level than they are now. Crop production is projected by yield trend variable, which is the estimated annual growth rate on yield during the last 5 years. No land shifts among crops occur.

**Trend.** Food consumption patterns are determined by the consumers' response to income growth. Individual crop production is projected by trend variable to the year 2000. Trade will be the difference between domestic consumption and production. No land shifts among crops occur.

**Urban Reform.** This scenario assumes price reforms would occur by the year 2000. Subsidies would be removed from consumption of agricultural commodities. Therefore, by the year 2000, China's consumers would pay the prices existing in world agricultural markets. The food consumption pattern in the year 2000 will be determined by both income and price effects. Crop production is again projected by the trend variables. No land shifts are permitted.

Table C-3--Scenarios for analyzing China's food consumption and production patterns in the year 2000

Assumptions	Scenario			
	No-growth	Baseline	Reform	Self-sufficiency
Real per capita income growth rate (percent per year):	0	5	5	5
Population growth rate (percent per year):	1.25	1.25	1.25	1.25
Income elasticities:				
Rice	na	-0.42	-0.42	-0.42
Wheat	na	0.20	0.20	0.20
Pork	na	0.50	0.50	0.50
Beef	na	1.10	1.10	1.10
Poultry	na	1.14	1.14	1.14
Corn	na	0.35	0.35	0.35
Soybeans	na	0.47	0.47	0.47
1988 prices (yuan/ton):	Domestic	Domestic	Reference <sup>1</sup>	Domestic
Rice	429	429	672	429
Wheat	506	506	416	506
Corn	381	381	403	381
Soybeans	1053	1053	972	1053
Pork	4516	4516	14459	4516
Beef	5484	5484	5709	5484
Poultry	1203	1203	1719	1203
Demand elasticities:				
Rice	na	na	-0.12	na
Wheat	na	na	-0.23	na
Corn	na	na	-0.45	na
Soybeans	na	na	-0.23	na
Pork	na	na	-0.40	na
Beef	na	na	-0.80	na
Poultry	na	na	-0.60	na
Production projection:	----- Trend variable <sup>2</sup> -----			Adjusted production to minimize grain imports
Land reallocation (million hectares):				
Rice	0	0	0	-4.94
Wheat	0	0	0	0.69
Corn	0	0	0	3.15
Soybeans	0	0	0	1.36

<sup>1</sup> Reference prices are calculated as the value of a specific commodity exported, divided by the total quantity exported from China. For wheat, the imported price to China is used. <sup>2</sup> Estimated growth rate on yield: rice = 0.47, wheat = 0.54, corn = 1.12, soybeans = 1.45.

Source: China Statistical Yearbook, 1991.

**Self-Sufficiency.** The food consumption pattern in the year 2001 is determined by income effects and assumes no price reforms. Crop production is assumed to adjust to the changes in consumption due to income effects. The demand for corn and soybeans would grow faster than increased production from improved productivity. This scenario assumes the government will avoid meat imports by increasing domestic production. As

a result, consumption of corn and soybeans will increase. On the other hand, a decline in rice demand along with increased production would raise the quantity available for export substantially. The thrust of this scenario is to minimize grain imports. The production adjustment would shift land from producing for exports to crops that would otherwise be imported.

## Projections Under Different Scenarios

The effects on consumption, production, and trade patterns of income growth and price reform are summarized in table C-4.

### *No-Growth Scenario*

Consumption. If there were no real per capita income growth and no price reforms for the next 12 years, the per capita utilization pattern would remain the same as in 1988. With a 1.25 percent annual population growth rate, agricultural commodities demanded would increase by 16 percent. The demand for corn and soybeans would rise faster than the demand for food grains to support higher meat consumption.

Production. In the no-growth scenario, we assume that there is no real per capita income growth. However, major crop yields would continue up as in the last five years. Corn production increases the fastest of all the commodities if trend variables are used to project food production patterns. Meat production will increase to satisfy the increased meat consumption.

Trade. Under the no-growth scenario, except for soybeans, the demand for grains will increase faster than the production growth. China would require rice imports of 8 mmt to meet increased demand for rice from the expanded population. The enlarged corn production from improved productivity is far greater than the increased consumption and enables China to export 11.5 mmt. Without the real per capita income growth, the higher production for soybeans nearly offsets the increased demand for food and feed. China will have to import a small amount of soybeans to support meat output in the year 2001.

### *Trend Scenario*

Consumption. Using the calculated income elasticities, we projected the food consumption pattern in the year 2001 to be dramatically different from 1988. The trend scenario takes into account the income effect. As a result of increases in per capita consumption of poultry, beef, and pork, per capita corn and soybean utilization will also expand. However, per capita rice utilization would decrease.

The demand for poultry would increase the most, followed by beef and pork. Feed demand for coarse grains, particularly corn and soybeans, would rise substantially to support increased domestic meat production. Corn, soybean, and wheat consumption are projected to increase, while rice consumption is projected to decrease.

Production. Projections for China's production of major agricultural commodities are the same as the no-growth scenario, in which trend variables are used for projection.

Trade. Under the trend scenario, the decreased rice consumption and increased production would cause quantities of rice available for exports to increase significantly. The demand for corn and soybeans would rise much faster than production. As a result, China would have to import corn and soybeans to support the increased meat consumption from population and income growth.

## *Urban Reform Scenario*

Consumption. The removal of price supports would partially restrain meat consumption from increasing as much as under the scenarios that consider only responses to income change. If both income and price effects were considered as in the urban reform scenario, total meat consumption would increase by 42 percent rather than 66 percent as in the trend scenario. Per capita pork and poultry consumption are slightly higher under the urban reform scenario than the trend scenario. Beef consumption, however, is slightly higher under the trend scenario. Per capita corn, soybean, rice, and wheat utilization would all be slightly higher under the urban reform scenario than under the trend scenario.

Production. The crop production pattern under the urban reform scenario is projected by using trend variables as in the no-growth and trend scenarios. Meat production will increase to meet increased consumption.

Trade. Under the urban reform scenario, rice and wheat exports would increase. Decreased demand from a removal of the meat price support would be more than offset by the increased consumption from income and population growth. Under the urban reform scenario, China will import a small amount of corn and a substantial amount of soybeans.

### *Self-Sufficiency Scenario*

Consumption. Assumptions involved in calculating food consumption pattern are the same as in the trend scenario. As a result, the consumption pattern in 2001 under the self-sufficiency scenario is the same as the trend scenario.

Production. At the higher income level, China would need to adjust land use in order to maintain feed grain self-sufficiency. The projected decrease in rice consumption, along with an increase in productivity, would make land available for growing other crops in the year 2001 while still producing enough rice for domestic consumption. Under the trend scenario, which considers population growth and consumers response to income growth, after meeting domestic consumption there would be 4.8 million hectares of rice land available for growing other crops. If China were to remain corn and soybean self-sufficient at the higher income level in the year 2001, it would require allocating an additional 6 million hectares (from the 1988-91 base) into producing corn and 2.5 million into soybeans.

Trade. Under the self-sufficiency scenario, China would export no rice in order to avoid corn and soybean imports. However, China would still import wheat.

## **Trade-Off Between Importing Meat and Importing Feed Grains**

If China does not increase domestic meat production, it will change into a large net meat importer in the year 2001 from a small net exporter in 1988. Using the trend scenario as an example, if China did not import feed grains to increase domestic meat production, pork is projected to change from exporting 60,000 tons in 1988 to importing 8.7 mmt in the year

Table C-4--China's food consumption, production and trade patterns in the year 2000, under different scenarios

Commodity	Base <sup>1</sup>	No-growth	Trend	Urban reform	Self-sufficiency
<b>Rice:</b>					
Per capita consumption (kg)	120.00	120.00	97.31	94.07	97.31
Consumption (mmt)	135.29	153.18	124.22	120.28	124.22
Production (mmt)	135.45	145.66	145.66	145.66	124.22
Trade (mmt)	0.16	-7.52	21.45	25.59	0
<b>Wheat:</b>					
Per capita consumption (kg)	94.19	94.19	103.91	104.84	103.91
Consumption (mmt)	106.19	120.23	132.65	133.84	132.65
Production (mmt)	92.61	98.90	98.90	98.90	104.27
Trade (mmt)	-13.88	-21.33	-33.75	-34.93	-28.38
<b>Corn:</b>					
Per capita consumption (kg)	74.02	74.02	89.78	87.19	89.78
Consumption (mmt)	83.46	99.67	114.60	111.30	114.30
Production (mmt)	87.97	111.19	111.19	111.19	114.30
Trade (mmt)	4.51	11.52	-3.42	-0.11	0
<b>Soybeans:</b>					
Per capita consumption (kg)	8.41	8.41	12.01	13.99	12.01
Consumption (mmt)	9.49	11.92	15.34	17.85	15.34
Production (mmt)	10.65	11.54	11.54	11.54	15.34
Trade (mmt)	1.16	-0.38	-3.80	-6.31	0
<b>Beef:</b>					
Per capita consumption (kg)	0.99	0.99	1.69	1.63	1.69
Consumption (mmt)	1.12	1.27	2.15	2.09	2.15
Production (mmt)	1.21	1.21	1.21	1.21	1.21
Trade (mmt)	0.08	0	0	0	0
<b>Poultry:</b>					
Per capita consumption (kg)	2.29	2.29	3.96	3.25	3.96
Consumption (mmt)	2.58	2.92	5.06	4.15	5.06
Production (mmt)	2.58	2.92	5.06	4.15	5.06
Trade (mmt)	0.46	0	0	0	0
<b>Pork:</b>					
Per capita consumption (kg)	19.59	19.59	25.00	21.40	25.00
Consumption (mmt)	22.09	25.01	31.92	27.32	31.92
Production (mmt)	22.09	25.01	31.92	27.32	31.92
Trade (mmt)	0.10	0	0	0	0
<b>Area required to meet self-sufficiency (million hectares):</b>					
Rice	32.56	34.28	27.80	26.87	27.80
Wheat	34.52	36.60	40.38	40.74	40.38
Corn	19.59	18.51	21.28	20.67	21.28
Soybeans	6.85	7.95	10.22	11.90	10.22
Total 4 crops	93.52	97.33	99.68	100.18	99.68
Shortage of land area <sup>2</sup>	2.42	6.23	8.58	9.08	8.58

<sup>1</sup> Base is the 4-year average from 1988 to 1991.

<sup>2</sup> Sown areas to crops in the base year of 1988 to 1991 are: rice 32.57 million hectares, wheat 30.08, corn 20.76 and soybeans 7.70. Total sown areas to these 4 crops in the base are 91.1 million hectares.

2000. China's beef trade is projected to change from exporting 50,000 tons in 1988 to importing 730,000 tons in the year 2000. China would likely need to import 3.04 mmt of poultry meat in the year 2000 to support the increase in demand. China would spend US\$43.6 billion to import the meat products, at 1988 prices. However, with this increase in demand from world meat markets, prices and the cost of importing meat would increase dramatically. The costs would become prohibitive. It is also doubtful that world markets could support demand.

The alternative to importing meat products would be for China to import corn and soybeans to increase domestic livestock production. To produce an additional 10 mmt of meat would require China to import an additional 23 mmt of corn and soybeans (table C-4). Using 1988 unit values of exports from China as a proxy for trade prices, it would cost China US\$ 829 million to import corn and soybeans. The costs would be even higher if we took into account the impact of the import increases on world prices.

## Conclusion

Higher income growth and marketing reforms in the next decade will produce a very different food consumption pattern in the year 2000 compared with the previous four decades. China's total meat consumption could increase by 66 percent. However, marketing reforms are likely to increase the demand. Taking into account both income and price effects, meat consumption could increase by about 45 percent.

With the increase in meat consumption, China would face the choice of either importing corn and soybeans to enlarge domestic meat production or importing meat. It is doubtful that world meat markets, especially pork, would be able to accommodate China's imports. Meat prices are much higher than feed grains, therefore, China is more likely to import corn and soybeans for domestic meat production. The decreases in rice consumption due to income growth would cause the amount of rice for export to increase substantially. Without production adjustments, China would export rice and import large amounts of feed grains in the year 2000. Given the very thin world rice markets, China is more likely to shift land from rice production to producing corn, soybeans and wheat to minimize grain imports.

## Endnotes

1. There is a discrepancy between the published per capita meat consumption and the total consumption (defined as production minus net exports) divided by population. The published per capita meat consumption in 1988 is 18 kg (1).

Per capita consumption calculated by dividing total consumption by population is 21 kg.

2. The exchange rate for China's currency, the yuan, was 1 US\$ to 3.72 yuan in 1988. The exchange rate for Taiwan's currency, the NT dollar, was 1 US\$ to 40 NT\$ in 1965. Taiwan's per capita income in 1965 was about US\$87 (NT\$3754) which converts to US\$300 using a 1988 deflator of 1965 = 28.8.
3. The income elasticities for corn and soybeans are calculated by dividing the percentage increase in quantity demanded for corn or soybeans by 12 years (1988-2000) and further divided by the income growth rate (5 percent).
4. To reflect the similar quality of agricultural commodities consumed, we use the unit value of exports for Asia as reference prices for trade.
5. Under the HPRS, households negotiated contracts with the collective to farm a parcel of land. The contracted household returned a specified amount of their crops to the collective as payment for use of the land. Output raised in excess of state and collective obligations are a reward to the household.

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# China's Agricultural Marketing System in the 1980's

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**Abstract:** Several important policy measures were introduced during the 1980's to facilitate market development in China's agricultural sector. First, the government supported the resurrection of open markets in both rural and urban areas. Also, the government allowed peasants to sell agricultural output at those open markets (even grains, after meeting government quota procurements). By the end of the 1980's, commodities subject to state quota procurement were limited to staple goods, and the ratio of quota procurement to total production had declined. Despite rapid changes since 1978, a number of major obstacles hamper China's prospects for continued market development in the 1990's. Foremost is the state's continued reliance on grain and oilseed procurements to supply urban residents. China's inadequate infrastructure also limits market development. However, the government has taken a number of important steps since 1990 towards dismantling the urban rationing system, improving infrastructure, and promoting the development of national wholesale agricultural markets.

**Keywords:** China, market, procurement, sales, grain, oilseeds, vegetables, fruit, and open markets.

Prior to 1979, the production and distribution of almost all of China's agricultural commodities were governed by rigid central planning. Compulsory quotas for most products were set at prices well below the world market. China also had a subsidized food policy under which it distributed centrally procured agricultural commodities to urban residents at very low prices. The net effect of the planning system was to support industrial development by taxing agriculture.

Under the pre-reform commune system, production incentives were low, and as a result, agricultural productivity remained low. To stimulate productivity, the government has initiated a number of economic reforms since 1979, of which the most important was shifting decision-making to the individual farm household. Additional complementary reforms were made in the highly centralized and tightly controlled system of procurement, distribution, and marketing of agricultural production. However, these reforms were limited both in degree and in the commodities included. Most importantly, the urban rationing system for grains and edible oils remains. But, a number of liberalizing policy changes introduced in the 1990's suggest that the government is attempting to accelerate and broaden reform of the marketing and rationing systems.

This article, focusing on the period between 1980 and 1990, will first give an overview of market development in China's agricultural sector. Then it will discuss a number of the most important changes introduced during the 1980's in the government's system of procurement and distribution of major agricultural commodities. And finally, it will examine some of the most important post-1990 changes in the state marketing system, including the recent upsurge in the number and influence of open markets.

## Marketing System Development in the 1980's

Since 1978, China's private sector has become increasingly important in the circulation of goods. Private sector sales are defined as those that do not go through central, provincial, or

local government retail establishments or through cooperatives controlled by a provincial or local government. During the 1980's, the proportion of retail sales through market channels, including all consumer goods and agricultural inputs sold to peasants, increased from 2 percent in 1978 to 29 percent in 1990 (table D-1). In contrast, the shares of state and collective retail sales declined from 55 to 40 percent and 43 to 32 percent, respectively. In addition, collectives evolved over the decade from completely government-controlled to semi-independent bodies -- many established by private individuals and supervised much less closely by the government.

Several policy measures were introduced in the 1980's to facilitate market development in China's agricultural sector. The first and most important was the adoption of the household production responsibility system (HPRS). This allowed peasants to sell surplus output at open markets for a higher over-quota price once state obligations were fulfilled. Secondly, by 1985, the government had reduced the number of commodities under state quota procurement from 180 to 21 (1). Furthermore, for those commodities still under the quota procurement regime, government procurements as a share of total procurements had also declined. For grains, the proportion of state to total procurement dropped from 99 percent in 1979 to 74 percent in 1985 (table D-2). Between 1986 and 1989, the proportion stabilized at about 82 percent (12). And finally, the buying and selling of major agricultural commodities, most importantly grain and oilseed crops, were managed under a double track system of procurement and pricing. Under the production responsibility system, the state's low fixed prices for quota procurement coexisted with negotiated and market prices.

State-set quota prices were generally much lower than either negotiated or market prices. Quota prices were paid for the minimum amount of the agricultural commodity that the peasant household must deliver to the state. This quantity and price were written into the contract that each household signed prior to the planting season. In contrast, the state determined negotiated prices by calculating the level necessary to meet urban and industrial commitments relative to its guaranteed quota procurements and current stock levels. In other words,

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Table D-1--Value of retail sales of consumer goods, by source, 1978-90

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Value in billion yuan													
Total (sum)	155.9	180.0	115.0	235.0	257.0	284.9	337.6	430.5	495.0	582.0	744.0	810.1	830.0
State <sup>1</sup>	85.1	97.2	11.1	117.2	125.2	133.9	153.8	174.0	195.1	224.9	293.6	316.8	328.6
Collective <sup>2</sup>	67.4	77.6	95.5	105.1	113.1	119.0	133.7	160.0	180.4	208.0	255.8	269.0	263.1
Joint-venture	0.0	0.0	0.0	0.1	0.2	0.4	0.8	1.3	1.5	1.9	2.7	3.6	4.0
Private Sector	3.3	5.2	8.4	12.8	18.7	32.1	50.1	96.5	119.5	149.1	194.6	224.4	238.3
Individual traders <sup>3</sup>	0.2	0.4	1.5	3.7	7.5	18.5	32.4	66.1	80.5	101.2	132.4	151.0	157.0
Rural to non-rural <sup>4</sup>	3.1	4.8	6.9	8.9	11.1	13.3	17.0	29.1	37.5	46.1	59.5	69.8	77.3
Percentage share of the total													
Total (sum)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
State	54.6	54.0	9.6	49.9	48.7	47.0	45.6	40.4	39.4	38.6	39.5	39.1	39.6
Collective	43.3	43.1	83.0	44.7	44.0	41.8	39.6	37.2	36.4	35.7	34.4	33.2	31.7
Joint-venture	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.5	0.5
Private Sector	2.1	2.9	7.3	5.4	7.3	11.3	14.9	22.4	24.1	25.6	26.2	27.7	28.7
Individual traders	0.1	0.2	1.3	1.6	2.9	6.5	9.6	15.4	16.3	17.4	17.8	18.6	18.9
Rural to non-rural	2.0	2.6	6.0	3.8	4.3	4.7	5.0	6.8	7.6	7.9	8.0	8.6	9.3
Percentage growth over the previous year													
Total (sum)	--	15.5	-36.1	104.4	9.4	10.9	18.5	27.5	15.0	17.6	27.8	8.9	2.5
State	--	14.2	-88.6	958.3	6.8	7.0	14.9	13.1	12.1	15.3	30.5	7.9	3.7
Collective	--	15.1	23.0	10.0	7.7	5.1	12.4	19.7	12.7	15.3	23.0	5.2	-2.2
Joint-venture	--	--	--	175.0	45.5	125.0	111.1	67.1	19.7	23.7	44.7	33.5	11.0
Private Sector	--	56.0	62.9	51.5	46.2	71.7	56.1	92.4	23.9	24.8	30.5	15.3	6.2
Individual traders	--	104.8	248.8	149.3	99.5	147.3	75.5	104.2	21.8	25.7	30.9	14.0	4.0
Rural to non-rural	--	52.7	45.3	29.6	23.9	20.0	27.8	71.2	28.9	22.9	29.1	17.3	10.8

<sup>1</sup> Sales by state-owned commercial enterprises. <sup>2</sup> Sales by collectively-owned commercial enterprises. <sup>3</sup> Sales by privately-owned and operated commercial enterprises -- the majority are individual household enterprises. <sup>4</sup> Sales by rural residents directly to urban residents and enterprises.

Sources: China Statistical Yearbook, various issues.

negotiated prices were at least partially determined by market supply and demand conditions. Market prices were simply the prices extant in open (free) markets. These prices were not subject to government control.

By the end of the 1980's, only the two most essential food commodities, grain and oilseed crops, remained subject to strict government quota procurement. However, the government had gradually increased the proportion of these two commodities procured at negotiated prices and decreased the proportion at fixed prices (table D-2). A few agricultural commodities, notably vegetables and fruits, were completely free of government control. On the other hand, cotton, tobacco, and silk remained tightly state-controlled.

Even with the rural economic reforms of the 1980's, market development in China has progressed slowly. Over the decade, a decreasing amount of total agricultural production has been retained on-farm for the peasant's own consumption. The ratio of the value of total agricultural products sold to the gross

value of agricultural output increased from 40 percent in 1978 to 52 percent in 1989 (2). In other words, of the total value of agricultural output in 1978, 60 percent was retained on-farm and 40 was sold to the state or on the open market. By 1989, the ratio had only changed to 48 percent retained and 52 sold.

One indicator of China's market development is the increase in the commercialization ratio -- a measure of the proportion of total production supplied to society either through government distribution channels or markets relative to the share reserved for own consumption (table D-3). The ratio rises as increased amounts of total production are marketed. The amount of grain retained on-farm has declined largely because of growing government procurements. Even with the increase circulating off-farm, grain still has the lowest commercialization ratio among all agricultural commodities -- fully two-thirds remains in rural areas for on-farm consumption. The commercialization ratio for oilseed crops has also increased because of higher government procurement. Less than one-third of oilseed crops remain on-farm for peasant's own consumption, while the rest

**Table D-2--Total and state grain procurements, 1979-90**

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Million metric tons, trade grain												
Total, all sources	60.1	61.3	68.5	78.1	102.5	117.2	107.6	115.2	120.9	120.0	121.4	140.0
State, total	59.3	58.8	62.7	73.7	98.7	111.7	79.3	94.5	99.2	94.8	100.4	95.6
Contract:												
Total	54.0	50.2	52.1	56.2	91.2	102.4	59.6	62.2	56.9	50.0	48.9	51.8
Rice	19.9	18.8	20.5	21.4	31.0	36.4	24.0	23.2	19.8	18.0	19.6	20.2
Wheat	14.9	12.6	12.2	14.6	26.2	32.1	23.1	22.6	17.7	17.0	16.9	17.0
Corn	16.1	15.8	16.2	17.0	28.6	28.4	10.5	13.8	17.2	12.0	10.2	12.5
Soybean	2.4	2.3	2.4	2.5	4.2	4.2	1.5	2.0	2.2	2.0	1.6	2.2
Negotiated:												
Total	5.2	8.6	10.6	17.5	7.5	9.3	19.6	32.3	42.3	44.8	51.6	43.7
Rice	2.1	3.3	3.7	7.6	2.1	2.2	6.2	9.4	11.7	14.1	16.7	11.3
Wheat	0.7	1.3	2.0	4.7	1.4	2.2	3.5	5.9	10.5	9.9	11.7	8.5
Corn	1.8	2.9	3.5	3.7	2.9	3.6	7.2	12.3	14.8	15.5	15.7	18.8
Soybean	0.5	0.8	0.9	1.0	0.8	1.0	1.9	3.3	3.9	3.8	4.6	4.5

Sources: China Statistical Yearbook, 1991, p. 587; Gu Qifu, "Government Intervention in Food Grain Distribution in China,"; and China Commerce Yearbooks, 1988-91.

**Table D-3--Commercialization ratio for major agricultural commodities, China, 1978-90<sup>1</sup>**

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Grain	20.3	21.7	22.8	24.2	25.9	30.9	34.8	30.5	33.8	34.4	34.9	34.4	36.6
Oil crops	55.8	62.1	71.1	76.4	71.9	65.4	67.4	68.4	74.9	74.6	74.1	73.0	72.4
Cotton <sup>2</sup>	94.3	97.8	99.0	98.0	97.2	96.6	95.9	104.1	107.2	95.9	91.1	87.3	90.7
Pork	64.1	66.1	66.0	64.7	65.7	63.2	69.2	67.1	67.5	68.9	62.5	60.6	59.7
Aquatic	67.7	68.6	62.3	62.0	65.3	58.0	58.2	55.4	44.9	44.7	41.2	47.5	46.5

<sup>1</sup> The commercialization ratio equals the total amount of a product marketed over total production.

<sup>2</sup> The 1985 and 1986 cotton ratios exceeded 100 percent because the 1984 crop was so large that purchases fell into the next two years.

Source: China Statistical Yearbook, 1991, p. 589.

remain tightly controlled by the state. In 1990, government oilseed crop procurements supplied 80 percent of total edible oil retail sales. The commercialization ratios for sugar, cotton, silk, and tobacco in 1990 were close to 100 percent, though the government maintained its purchasing monopoly.

The commercialization ratios for pork and aquatic products have fallen since 1978 despite the fact that both were liberalized in the mid-1980's. The reason is that production increased at the same time as commodities were liberalized and government purchases declined. Also, it is likely that pork and aquatic open market sales are undercounted and the real commercialization ratio is in fact somewhat higher (perhaps as high as 70 to 75 percent). Now that relatively less of these commodities are procured by the government, the impact of that undercounting is more important for pork and aquatic products than for grain, oilseeds, or cotton.

Rising individual incomes have increased demand for meat. In China, where meat production is still in a primitive stage, upwards of 90 percent of output is supplied by rural backyard livestock operations. These tend to be relatively inefficient, raising only a few head. Since 1978, the rapid development of rural enterprise in China increased the opportunity costs for rural households expanding meat output. Therefore, despite rising urban and rural consumption levels and the steady pressure of increased demand for meat, particularly in urban areas, the commercialization ratio for meat has fallen slightly.

The commercialization ratios for fruits and vegetables are about the same as pork. The marketing of these two commodities has been completely freed of government quotas or rationing (though a few types of vegetables may be rationed for certain holidays or during winter months in certain large cities). Removal of government control over these commodities

Table D-4--Value of procurement of agricultural commodities, by source, 1978-90

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Value in billion yuan													
Total <sup>1</sup>	57.9	73.5	86.7	98.0	111.0	129.4	147.5	173.7	204.8	243.3	306.5	345.1	377.5
Commerce <sup>2</sup>	46.0	58.7	67.7	76.5	85.6	98.1	107.0	107.2	125.8	144.4	179.4	205.4	225.9
Private sector	9.8	12.7	16.5	19.0	22.7	28.4	37.0	60.8	73.2	92.5	120.4	133.2	145.2
Industrial/other <sup>3</sup>	6.7	7.9	9.6	10.1	11.7	15.1	20.0	32.6	37.4	48.7	63.4	65.7	70.5
Rural to non-rural <sup>4</sup>	3.1	4.8	6.9	8.9	11.1	13.3	16.9	28.2	35.8	43.8	57.0	67.5	74.8
Other	2.1	2.1	2.5	2.5	2.7	2.9	3.5	5.7	5.8	6.4	6.7	6.5	6.4
Percentage share of the total													
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Commerce	79.4	79.8	78.1	78.0	77.1	75.8	72.6	61.7	61.4	59.4	58.5	59.5	59.8
Private sector	16.9	17.3	19.1	19.4	20.5	22.0	25.1	35.0	35.7	38.0	39.3	38.6	38.5
Industrial/others	11.6	10.8	11.1	10.3	10.5	11.7	13.6	18.8	18.3	20.0	20.7	19.1	18.7
Rural to non-rural	5.4	6.5	8.0	9.1	10.0	10.3	11.5	16.2	17.5	18.0	18.6	19.6	19.8
Percentage growth over the previous year													
Total	--	26.9	17.9	13.1	13.2	16.6	14.0	17.8	17.9	18.8	26.0	12.6	9.4
Commerce	--	27.6	15.4	13.0	11.9	14.6	9.2	0.2	17.4	14.8	24.2	14.5	10.0
Private sector	--	29.4	30.3	15.2	19.5	25.1	30.0	64.5	20.4	26.4	30.1	10.7	9.0
Industrial/others	--	18.5	21.3	4.9	15.6	29.9	32.3	62.8	14.7	30.2	30.1	3.7	7.2
Rural to non-rural	--	52.7	45.3	29.6	23.9	20.0	27.4	66.5	27.0	22.4	30.1	18.4	10.7

<sup>1</sup> Total procurement by all government and non-government sources.

<sup>2</sup> Procurement by state commercial and purchasing enterprises (e.g., the Grain Bureau, the Cotton and Jute Corporation, etc.).

<sup>3</sup> Procurement directly by industry and other non-government entities. Direct state-controlled industry procurements are included here if the procurements are outside of the official state commodity plan.

<sup>4</sup> Procurement by non-rural residents directly from rural residents (outside of established open markets).

same degree as fruits. Fruits and vegetables are similar to pork in that, despite increased demand, particularly in urban areas, booming rural industry has raised the opportunity cost of producing extra units of output beyond on-farm consumption. This is compounded by China's poor transportation infrastructure and a paucity of market information. As with pork and aquatic products, the open market sales of vegetables and fruits are also likely undercounted, putting their real commercialization ratios higher than reported.

Source: China Statistical Yearbook, 1991, p. 592.

prompted a relatively rapid increase in private marketing. By 1990, the commercialization ratio for apples was 59 percent and the ratio for citrus fruits was 48 percent (4). Although the data are not available, vegetable marketing likely developed to the same degree as fruits. Fruits and vegetables are similar to pork in that, despite increased demand, particularly in urban areas, booming rural industry has raised the opportunity cost of producing extra units of output beyond on-farm consumption. This is compounded by China's insufficient transportation infrastructure and the paucity of market information available to peasants. And as with pork and aquatic products, the open market sales of vegetables and fruits are also likely undercounted, putting their real commercialization ratio higher than reported.

The total value of society's purchases of agricultural products increased at a rate of more than 10 percent per year in the 1980's (table D-4). Purchases of agricultural products by the private sector, including direct industrial purchases and

peasants' direct sales to non-rural areas, increased much faster than state purchases. As a share of total procurement, agricultural products sold to the private sector between 1978 and 1990 increased from 17 to 38 percent while state purchases fell from 79 to 60 percent. In the private sector, the share of peasants' direct sales to non-rural areas rose much faster than direct purchases of agricultural commodities by industry because of the explosion in small free markets near many cities and townships as a result of rural reform and continued government interference in industry purchasing.

However, agricultural output began to level off in the latter part of the 1980's and the rate of growth of private sector purchases relative to state purchases slowed significantly. Instead of an increased supply of agricultural output driving free market development, future gains in private sector circulation of goods will depend on developing marketing channels as well as additional market and price reforms on the part of the government.

Table D-5--Total value of open market sales, by commodity, 1978-90<sup>1</sup>

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Value in billion yuan													
Total	12.5	17.1	21.2	25.3	28.7	32.8	38.2	51.2	90.7	115.8	162.1	197.4	216.8
Grain & oils	2.0	2.9	3.4	3.6	3.9	4.3	4.6	5.0	7.1	8.5	10.8	14.3	14.7
Grain <sup>2</sup>	1.6	2.4	2.8	2.9	3.1	3.4	3.4	3.5	4.8	5.8	7.2	9.2	9.5
Oils <sup>2</sup>	0.4	0.5	0.7	0.8	0.8	1.0	1.1	1.5	2.3	2.7	3.6	5.1	5.2
Meat & dairy	2.1	3.3	4.2	5.1	5.8	7.3	9.2	14.0	24.7	32.0	46.0	57.1	61.9
Vegetables & fruits	1.8	2.3	2.9	3.4	3.8	4.6	5.7	7.4	15.6	21.4	31.6	39.9	44.8
Vegetables	1.4	1.7	2.2	2.6	2.7	3.3	3.8	4.9	9.7	13.1	19.3	23.8	26.4
Fruits	0.4	0.6	0.8	0.9	1.0	1.3	1.9	2.5	5.9	8.3	12.3	16.1	18.4
Other <sup>3</sup>	6.6	8.6	10.7	13.2	15.2	16.6	18.7	24.8	43.3	53.9	73.7	86.1	95.4
Percentage share of the total													
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Grains & oils	16.1	16.7	16.2	14.4	13.7	13.2	11.9	9.7	7.9	7.3	6.7	7.2	6.8
Grain	13.0	14.0	13.1	11.3	10.9	10.3	9.0	6.8	5.3	5.0	4.4	4.7	4.4
Oils	3.0	2.8	3.2	3.1	2.8	2.9	3.0	2.9	2.5	2.3	2.2	2.6	2.4
Meat & dairy	16.9	19.5	19.9	20.1	20.1	22.2	24.1	27.4	27.2	27.7	28.4	28.9	28.5
Vegetables & fruits	14.6	13.5	13.7	13.5	13.1	14.2	14.9	14.5	17.2	18.5	19.5	20.2	20.6
Vegetables	11.4	10.0	10.2	10.1	9.5	10.1	10.0	9.5	10.7	11.3	11.9	12.1	12.2
Fruits	3.2	3.5	3.5	3.5	3.6	4.1	4.9	5.0	6.5	7.2	7.6	8.2	8.5
Percentage growth over the previous year													
Total	--	36.4	23.9	19.6	13.3	14.3	16.4	34.0	77.2	27.7	40.0	21.7	9.9
Grain & oils	--	42.3	20.3	5.8	8.2	10.2	5.1	8.8	43.5	19.0	27.6	32.0	2.9
Grain	--	46.6	15.9	2.9	9.8	8.3	1.2	1.2	38.9	20.3	24.1	27.9	2.9
Oils	--	23.7	42.6	17.9	2.5	17.3	18.9	31.9	54.4	16.1	35.2	40.2	2.9
Meat & dairy	--	57.1	26.4	20.9	13.2	26.6	25.9	52.6	76.2	29.7	43.7	24.0	8.4
Vegetables & fruits	--	26.2	25.5	18.3	9.3	23.7	22.6	30.4	110.5	37.1	47.5	26.4	12.1
Vegetables	--	19.6	25.7	18.6	6.7	21.7	15.7	27.4	98.6	35.2	47.3	23.4	10.9
Fruits	--	50.0	25.0	17.3	17.0	29.1	39.8	36.6	133.5	40.1	47.9	31.0	14.0

<sup>1</sup> Data for 1978-1987 include direct peasant to non-peasant sales conducted outside of markets. However, the sources do not indicate whether or not 1988-90 data include direct peasant to non-peasant sales. Also, 1978-85 data only report rural market transactions, while the 1986-90 data include transactions in both rural and urban markets. Finally, all years exclude transactions in urban industrial commodity markets. <sup>2</sup> 1990 grain and 1990 oils estimated using 1989 proportions. <sup>3</sup> Includes aquatic products, agricultural inputs, and large animals (cattle, horses, etc).

Sources: China Market Statistics Yearbook, 1990, p. 340; and China Statistics Yearbook, 1991, p. 605.

## Procurement System Reform

Throughout the 1980's, the government gradually increased the role of the market in the production and procurement of major agricultural commodities. With the introduction of the HPRS, individual peasants were allowed to manage their own crop and livestock activities after meeting state contract and collective obligations. Peasants could then sell their surplus either to the government or on the open market.

Following the introduction of rural reforms in 1979, output of agricultural commodities grew rapidly and peaked in 1984. The government was then forced to raise the negotiated portion of its procurement (table D-2), as well as the negotiated price,

in order to increase agricultural output and meet state agricultural commodity commitments to urban residents. By the late 1980's, the prices paid for negotiated procurement rose to the point that some were higher than world market prices.

Under the two-track procurement system, purchases of grain and oilseed crops through government channels has accounted for more than 80 percent of total purchases. By 1990, hogs and pork purchased through government channels declined to less than 60 percent of purchases, while eggs and aquatic products fell to less than half of purchases.

In addition to the government's declining share of purchased agricultural commodities, there has been a shift in the balance

between contract and negotiated procurements. For non-staple commodities, including pork, vegetables, and fruits, the majority, if not all, of state purchases are now negotiated. For staple commodities, the ratio of contract to negotiated purchases has generally declined. Negotiated grain purchases fell from 9 to 8 percent of total state procurements between 1979 and 1984. Between 1984 and 1989, the proportion rose from 8 percent to 51 percent. In 1990, the negotiated portion of state grain purchases fell 5 percent because the record 1990 grain harvest caused open market prices to fall below state negotiated prices. Lower free market prices then caused negotiated prices to fall, reducing peasant desire to sell to the state. Negotiated edible oil purchases rose from 4 percent of government purchases in 1978 to 22 percent in 1990 (3).

## Distribution System Reform

Between 1949 and 1955, China's traditional rural and urban markets were absorbed into a state-controlled system. Over the next 20 years, the existence of open (non-state) markets ebbed and flowed with the political winds. Even when markets operated, fruits and vegetables were generally the only commodities allowed. Then in 1977, after a 10 year absence of open markets, the government reversed its no-market policy. In order to promote more efficient marketing of agricultural commodities, open markets were once again allowed to operate, and for the first time since 1949, agricultural products other than fruits and vegetables were sold.

Beginning in 1978, grain, oilseed, and other staple crops (but still excluding cotton, tobacco, silk, and sugar) produced beyond government procurement quotas could be sold at the newly revived open markets. Participation was initially restricted to commune, brigade, and team members, and market management committees (the administrative arm of the government overseeing all open market activities) regulated the kinds of commodities allowed and the range of prices. However, open markets were gradually liberalized and most state interference in open market operations was eliminated by the mid-1980's (5).

The new open market policy was quite successful. The total value of transactions in rural and urban open markets rose from 12.5 billion yuan in 1978 to 216.8 billion in 1990, an average annual growth of nearly 28 percent (table D-5). However, the state had not relaxed price and procurement controls evenly across commodities. Sales of meat and dairy products and high-valued cash crops were generally less strictly controlled than grains and oils. The open market sales of meat and dairy products and fruits and vegetables grew at average rates of 33.7 and 32.5 percent, while grain and oils increased at 18.8 percent.

Although the gross value of combined grains and oils sold through the open market has grown steadily since market liberalization began in 1977, its relative share of sales has declined. As a share of transactions, combined grain and oil sales declined steadily, falling from 16 percent in 1978 to 7 percent in 1990. In contrast, the value of total sales and the open market share for meat and dairy products and fruits and vegetables have grown remarkably. Between 1978 and 1990, the combined share of open market sales transactions for meat

and dairy products, fruits, and vegetables rose from 32 to 49 percent.

Besides China's inadequate transportation and storage infrastructure, the foremost obstacles to increased market development in the grain sector have been urban rationing and the procurement system necessary to supply it. Despite the fact that restrictions on open market sales were loosened, the volume of grain moving through open markets in 1990 was only equal to 8 percent of the government's 96 million tons of contract and negotiated grain purchases (9). The government continues to act essentially as a monopsony -- determining the prices peasants receive for grain. Prices, rather than reflecting supply and demand conditions and allocating resources efficiently, were simply an administrative means by which the government met policy objectives.

In 1985, the government removed all or part of the urban rationing system controls for fruits, vegetables, livestock products, and some other non-staple products. Livestock products, for instance, continued to be rationed but subsidies were reduced. The prices for many of these commodities were allowed to float in accordance with, or at least be guided by, supply and demand. This change, together with rising urban demand, encouraged increased production as profit margins rose relative to grains and oils for which the state-contracted part of procurement was still purchased at below market prices. Not surprisingly, area sown to grain and oilseed crops has decreased, while the area sown to fruits, vegetables, and other cash crops has expanded. Increased production of fruits, vegetables, and livestock products slowed growth in prices compared to the higher prices the state used to increase output of other controlled agricultural commodities.

In contrast to the reform of non-staple commodities, initially there was very little reform of the government's system to control urban consumption and distribute staples. Sensitive to the demands of urban residents and their resistance to paying higher food prices, the government was hesitant to reduce state control over the urban staple commodity distribution system.

The dual-track procurement and retail pricing system was introduced in 1985 in order to alleviate pressures to dismantle the urban staple subsidy system. However, despite the introduction of negotiated-price retail sales to counterbalance negotiated price purchases, the subsidy necessary to make up the price difference between procurement and subsidized resale climbed from 1 billion yuan in 1978 to 39 billion in 1990 (4). Government subsidies rose because the share of negotiated purchase prices rose much more quickly than the share of negotiated retail prices. The state chose to maintain relatively heavy subsidies for urban consumption of staple commodities rather than risk urban consumer unrest or reinstate harsher procurement rules for farmers.

In addition to the heavy burden on the state budget, the rationing system has also caused unnecessarily high levels of waste of the controlled commodities. The amount guaranteed by ration coupons was set in 1955 when grains and edible oils accounted for a large portion of individual diets. However, as economic reforms brought substantial increases in per capita incomes, consumers were willing and able to diversify their

diets. The artificially low prices for food grain and edible oils provided urban consumers with little incentive to conserve.

## Recent Changes in China's Marketing System

Towards the end of the 1980's, China's government finally recognized the urgent need to reform the urban subsidy system. The central government authorized limited, localized reform experiments in the late 1980's that in some cases allowed grain prices to rise to market determined levels. One of the first experiments, at the Guanghan Experiment Station in Sichuan province, abolished the ration coupon system and compensated workers in cash. Building on this, officials in Guangdong province raised urban grain ration prices and compensated urban residents with a cash payment of 13.9 yuan (about 9.5 percent of the average wage rate) per wage earner per month. Guangdong's urban residents were free to use this money to consume any food or non-food products they might choose. However, they still received grain coupons to guarantee the quantity of grain they were entitled to receive (10).

In 1990 China's grain and oilseed crop harvests reached record highs -- 446 million tons of grain and 16 million tons of oilseed crops. By 1991, the increased quantity of these commodities in storage, falling open market prices, and another successful year forecast for grain and oilseed crop production, prompted the central government to begin nationwide reform of the urban rationing system. On May 1, 1991, the government raised the subsidized urban retail prices for wheat flour, milled rice, and corn flour by 56 percent, 70 percent, and 64 percent, respectively, while edible oil prices were increased about 158 percent (11). This was the first time that urban rationed food prices had been raised since the mid 1960's. These increases were received calmly by the urban population, with only a very brief period of panic buying. Following another successful grain harvest in 1991 and buoyed by the success of the 1991 price increases, China's government again increased rationed urban grain prices by an average of 40 percent on April 1, 1992 (13).

At the provincial level, Guangdong province, the Shenzhen Special Economic Zone within Guangdong, and Hainan province all announced in the spring of 1992 that they would completely eliminate government intervention in the grain sector, including abolishing the urban grain and oil rationing system. Urban residents would continue to receive a cash compensation, but not the coupons guaranteeing a certain minimum quantity of grain or oil.

Other reforms introduced in 1991 included raising the coupon prices for vegetable oils and eliminating the sugar rationing system and decontrolling sugar marketing and distribution. All the reforms and price increases are expected to reduce the burden on the central government budget, cut down on waste, and accelerate the circulation of staple agricultural commodities through the blossoming system of open markets.

### *Open Markets Increase Rapidly*

Following a virtual 10-year absence of open markets during the political upheavals of the Cultural Revolution, open markets reemerged following an official "rehabilitation" in 1978. The

number of open markets in China increased from 33,302 in 1978 to 72,579 in 1990 as an ever-growing share of agricultural commodities were totally or partially freed of government control. The value of sales in open markets rose from 12.5 billion yuan in 1978 to 216.8 in 1990. More than 80 percent of open markets are in rural areas (4,8).

Local agricultural markets, founded on the system of country trade fairs, were the first to reemerge, but were restricted to buyers and sellers from within the county or prefecture where the market was located. Inter-prefecture and inter-provincial boundaries were erected by local governments to protect their farmers and commercial operations. However, increased quantities of vegetables and fruits moving through these local open markets, plus persistent central government (and later provincial government) pressure to allow cross-border movements of agricultural commodities, prompted the emergence of regional (province-level) open markets handling larger quantities of goods. The larger regional markets have been established by various government agencies involved in marketing agricultural commodities, sometimes in partnership with government-owned enterprises or cooperatives. In general, these regional markets are restricted to handling grains, oilseed crops, and meats.

Throughout the 1980's, central and municipal government investment in was targeted at establishing production bases for vegetables and other commodities around major urban centers and enlarging the local and regional markets. Over the last couple of years, a number of national-level markets have emerged that are open to buyers from anywhere in the country and allow purchases of much larger quantities of commodities.

Open markets specifically for agricultural products (including local and regional/national markets), sometimes referred to as agricultural wholesale markets, increased from approximately 235 in 1983 to 1,509 in 1991. Of the total number of agricultural wholesale markets in 1991, 690 were vegetable markets, 470 were dry and fresh fruit markets, and over 500 were grain markets (some markets handled more than one commodity, so the sum of the parts is larger than the total number of markets) (6,14,15).

The removal of most government interference from the marketing of non-staples spawned rapid growth in agricultural open markets. These markets are now the primary conduit for distributing non-staples to urban centers and larger rural townships. In 1990, the volume of fruits, vegetables, aquatic products, eggs, poultry, and beef moving through open markets ranged from 125 to 293 percent larger than sales through the state system (table D-6). In contrast, open market grain and vegetable oil sales in 1990 accounted for 3 and 11 percent, respectively, of state sales.

Comparing the growth of open market sales of agricultural goods between 1988 and 1990, mutton sales registered the highest growth at 64 percent, though the gross quantity moving through the open market system was less than 6 percent of the volume of pork sales. Vegetable, grain, vegetable oil, and egg sales increased between 8 and 25 percent. Many officials in China believe that the volume of open market sales is under-reported. Grain sales in 1989, for instance, were officially

reported as 7 million tons, though one commercial official in China believed the actual volume was probably closer to 10 million (6). And the larger the volume of a commodity moving through the open market system, the greater the likelihood of undercounting. Under this assumption, vegetables and fruits are undercounted proportionally more than grain, edible oils, and livestock products.

**Table D-6--Open market sales volume, 1988-90**

Commodity	1988	1989	1990
Million metric tons			
Grain	7.07	6.88	7.70
Edible oil	0.61	0.51	0.72
Pork	5.02	5.44	6.19
Beef	0.40	0.44	0.50
Mutton	0.22	0.33	0.36
Poultry	1.17	1.17	1.31
Eggs	1.46	1.41	1.58
Aquatic products	2.67	3.00	3.38
Vegetables	26.51	30.85	33.16
Fruits	9.54	10.88	12.48

Sources: China Commerce Yearbooks, 1990-91.

Comparing the relative shares of commodities moving through the state system and through open markets between 1988 and 1990, eggs and vegetable oil increased while grain decreased. The volume of open market egg sales rose from 103 to 147 percent of total government egg sales. The ratio of vegetable oil open market sales to government sales climbed from 8 percent in 1988 to 11 percent in 1990. However, the open market volume of grain sales fell from 4 to 3 percent of government sales as good harvests and falling free market prices prompted increased sales to the government at higher negotiated prices.

There are other private channels for selling agricultural products in China, including direct peasant sales to residents in non-rural areas and peasant-to-peasant sales or barter. Peasant sales to non-peasants have probably accounted for more sales than direct peasant-to-peasant transactions. The total value of agricultural products sold by peasants to non-peasants increased from 3.1 billion yuan in 1978 to 77.3 in 1990, of which meat and dairy products increased the most dramatically, rising from 1 billion to 43 billion yuan. In contrast, grains and vegetable oils increased from 910 million yuan in 1978 to about 8 billion in 1990, with the volume of goods moving through the markets staying level at about 7 million tons (4).

Although the total volume of open market sales in 1991 was reported to have reached 260 billion yuan (assumed to exclude direct peasant to non-peasant sales), the majority of these transactions took place at smaller local-level rural and suburban markets. However, the number of regional markets are reported to be increasing quickly. At present there are only a

handful of true national open markets, though press reports have indicated the central government is working to remove many of the remaining provincial and local barriers to agricultural commodity flows. Notably, the State Council issued a circular in 1991 officially dismissing the ban on farmers peddling rice and reducing the restrictions on collectives and individual peasants wishing to become full-time dealers in grain, edible oil, sugar, pork, wool, hemp, and other agricultural products. The only commodities still under a private marketing ban are cotton, tobacco, and silkworm cocoons (8).

## Conclusion

The increased amount of goods moving through private market channels, the decreased quantities subject to state procurement, and the large number of commodities changing hands at free market prices are all evidence of the striking changes in China's agricultural marketing system during the 1980's. Even more striking, however, has been the rapid rise in the number of open markets, as well as the growing volume of goods moving through them, over the last 2 years. Despite the many changes that have already occurred, China's marketing system remains underdeveloped, and for at least some commodities, a continued target of state intervention.

Despite the many changes since 1978, a number of major obstacles hamper China's prospects for future market development. Foremost is the state's continued reliance on official grain and oilseed procurements to supply urban residents. The state's procurement and rationing systems distort supply and demand signals in the nascent open markets. Another major obstacle is China's inadequate infrastructure. Roads and rail lines are woefully overburdened, inhibiting the free flow of goods. China's fragmented pattern of land use is also an obstacle to market development because it retards potential gains from economies of scale. And finally, national integration of the open market system depends on removing the remaining government barriers to free movement of agricultural goods.

In terms of government policy, the two most pressing issues are the lingering adherence to agricultural self-sufficiency and the urban rationing system. There are signs that the government is seriously considering dismantling its urban food subsidy programs. Chronic central budget deficits, successful reform experiments in Guangdong and Hainan, and more than ample grain supplies in both public and private stocks, are pushing the government towards reform. Therefore, barring unforeseen changes in agricultural output and the political leadership, it is conceivable that the government will formally eliminate the grain and edible oil rationing systems as soon as 1993 or 1994.

However, even after eliminating the rationing system, the government will likely maintain some base level of grain purchases, though only at market determined prices, in order to have supplies of essential commodities on hand in case of disaster, to supply certain classes of government employees and poor families with basic rations, and to have a supply of essential agricultural commodities on hand to sell on the open market to dampen rapid price fluctuations. Even commodities still tightly controlled by the government, including cotton, tobacco, and silkworm cocoons, will likely be less tightly

controlled by the state in the future. All of these changes will promote China's market development. However, following liberalization of any of the currently controlled commodities, increased private marketing and distribution will likely not increase as rapidly as with the non-essential commodities during the 1980's because of infrastructure weaknesses and production rigidities caused by the fragmented system of crop lands.

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# Building a New Rural Socialist Order: Implications for Production, Income, and Trade

Frederick W. Crook\*

**Abstract:** China's leaders developed two campaigns in the late 1980's to stimulate rural production and strengthen rural socialist institutions. The socialist material civilization (SMC) campaign aims to boost rural output by improving the land contract system, providing more inputs and additional services for farmers, and investing more resources in rural areas. The socialist civilization (SC) campaign is designed to strengthen socialism in rural areas through improving education programs, building rural party branches, and developing rural economic cooperatives. In general the SMC campaign will have positive effects on production, income, and trade, while the SC campaign will have negative effects.

**Keywords:** Agricultural policy, investment, land tenure, inputs, and rural organizations.

China's leaders are in the midst of a campaign to build a "New Rural Socialist Order with Chinese Characteristics" (*You Zhongguo Tese de Shehui Zhuyi Xin Nongcun Shehui*) (1). Authorities are using two campaigns to build this new order: the "socialist material civilization" (*Shehui Wuzhi Wenming*) (SMC) campaign to boost output, economic efficiency, and raise incomes; and the "socialist civilization" (*Shehui Jingshen Wenming*) (SC) campaign to strengthen socialist institutions and inculcate socialist values in rural citizens.

## Socialist Material Civilization Campaign

China's leaders believe they are making significant contributions to the world's socialist experience by implementing the two-tier management system which consists of the household land contract system and the rural socialist service system (*nongcun shehui hua faxi tixi*) (2). Farmers enthusiastically support the land contract system because it has enabled them to allocate household resources to increase incomes. China's leaders strongly support the rural socialist service system because, while they believe the land contract system will boost production, they are unwilling to allow the development of a private service sector. They believe they need a mechanism to control relatively independent farm operators.

## Insure Stability of the Land Contract System

The primary government and party theme for rural areas in 1990-1992 has been to stabilize and improve the functioning of the household land contract system (1). From 1955 to the early 1980's cadres beat propaganda drums warning villagers about the dangers of private land ownership. Then beginning in the early 1980's farm families suddenly were granted limited land use rights to cultivate land. Farm families could not help but reflect on the many changes in party policy. Would the party reverse direction and change the policy?

Continued party involvement in managing the land contract system, debate within party circles about the merit of the land contract system, and experimentation in re-collectivizing land have led many farm families to have serious questions about the long-run stability of the land contract system. Farmers are

also nervous about experiments being conducted to reform the land contract system.

Authorities currently list 5 land reform experiments: Meitan county in Guizhou; Pingdu county in Shandong; Wuxi, Wu, and Changshu counties in Jiangsu; Shunyi county in Beijing; and Nanhai county in Guangdong (5). The most telling confidence indicator is that the peasants on the whole, have not invested in the land they cultivate. Rather they have invested in rural housing, consumer durables, and rural industrial production.

Officials acknowledge that consolidating holdings is necessary to improve irrigation, mechanization, and pest control. But officials promoting land consolidation schemes have encountered several difficulties. First, cadres worry that by promoting land consolidation they may be directly contributing to the development of a new "landlord class" of farmers. Second, the renegotiation of land contracts needs to be done on a voluntary basis to retain farmer confidence. Vice-Premier Tian Jiyun noted in this connection that "If we take back the land by force, it will lead to great disorder" (8). One method to consolidate land holdings is to allow farmers to sub-contract their land. Farmers wishing to exit farming to work in rural industry or commerce or to reduce the amount of land cultivated can simply sub-contract their land to another farmer.

## Strengthen Socialist Collective Services

Individual farm families have not been able to efficiently supply all the required technology and inputs. To boost output, farmers must depend on other institutions for inputs and services such as credit, seeds, and fertilizer. Authorities, unwilling to allow privatization of input services, plan to establish collective services. Officials want to encourage farmers with poor technical and managerial skills to exit or partially exit crop raising and enter new professions and lines of work in rural enterprises (including collective service work). Authorities want to expand collective services to create economic conditions that will permit economies of scale in rural areas. Officials also want to organize a collective service system which they control and which they can use as a mechanism to guide economic behavior.

A survey of current speeches and documents reveals that officials envision a wide array of pre-production, production,

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and post-production services that will be supplied to farmers. However, officials suggested different kinds of services.

Pre-production. Possible services include providing working capital, market information, and transport.

Production. Agricultural science and technology, seed, fertilizer, pesticides, herbicides, diesel fuel, electricity, irrigation water, veterinary services, breeding services, and farm machinery services--plowing, sowing, harvesting are some of the services possible.

Post-production. Full and intermediate processing of farm products, transport, storage, and marketing are services envisioned by officials.

There has been debate in the press regarding which institutions will provide services (11). Minister of Agriculture Liu Zhongyi noted that services should be developed to meet the requirements of farmers and that a single rigid service model should not be implemented in each township. Local officials establishing the service system were reminded by a State Council Research Office authority to follow Deng Xiaoping's principle laid down in a May 1989 speech. Deng said "A genuine Marxist-Leninist must understand, inherit, and develop Marxism-Leninism based on actual conditions, *for a fixed socialist pattern does not exist*" (italics added) (10).

### **Investment**

China's leaders expect investment to come from three sources: state, collective, and individual. During the seventh 5-year plan period (1986-1990) state investment in the agricultural sector was 3.3 percent of total, down substantially from 10.5 percent of total in the fifth 5-year plan period (1976-1980). By the end of the eighth 5-year plan (1991-1995) authorities expect to increase the rate of state investment to 6 percent and to increase investment in water control facilities and electrical power generation.

Authorities want township and village economic committees to induce farmers to invest surplus labor in local capital construction projects, such as water control works (irrigation dams, drainage ditches, and water control embankments), village buildings (schools, offices, and factory sites), farmland improvement, and roads. Local authorities will invest profits from township and village enterprises to develop collective service institutions that will supply materials and services to farmers (11).

From the state's point of view the most worrisome source of investment is that from individual rural households. From 1949 to 1980 cadres allocated investment funds, but beginning in the early 1980's individual households began to make investments as well. Authorities wanted households to fund agricultural production, especially grain output. Farmers, however, were driven more by the concepts of "rate of return" and "risk" than fulfillment of plan targets. Instead farmers invested in consumer durables and farm houses. From 1979 to 1990, farmers constructed an average of 683 million square meters of building space each year. In 1988, farmers invested 61 billion

yuan in housing compared with the state's agricultural construction investment of 3 billion yuan.

Rural households have also invested in rural enterprises that offered higher rates of return than crops. Many farmers purchased small 15-horsepower tractors, and earned money by hauling goods and passengers on country roads. Some set up family-run enterprises making handicraft goods or doing initial processing of agricultural products (noodles, tofu, and starch). Several households joined together to launch new firms making bricks and tiles, or mining sand and gravel.

### **Socialist Civilization Campaign**

The Central Committee outlined several reasons for the campaign. Under the influence of bourgeois liberalization, cadres emphasized production and slighted political and ideological work. Some basic-level party organizations are very weak and cannot perform a leading role in their jurisdiction. Feudal and bourgeois ideas have risen in some areas "causing chaos in public security and management" (1). There is growing hostility between villagers and the party. The movement was launched by the CPC Central Committee to consolidate "socialist political power" in the rural areas. After the coup d'etat failed in Moscow and reforms were instituted in the former Soviet Union, China's leaders focused energy on the rural socialist education movement (5). Party Secretary Jiang Zemin toured rural Hebei province in mid-September 1991 and reported that "whatever happens in the world, it is important for China to manage well its own domestic affairs" (5).

### **Socialist Education Program**

The socialist education program should assist the party reach its goals of "stabilizing rural areas and the country as a whole, guarding against peaceful evolution, promoting the construction of material and spiritual civilization..." (4). The Central Committee said the socialist education program will last 3 years and should complete three tasks. First, the campaign should ensure that socialist ideology occupies the rural positions. Second, the campaign should fully implement the party's principles and policies for rural areas. Third, it should strengthen the organization at the village level with the party branch as the core.

The Central Committee suggested that work teams implementing the program in rural villages use a wide variety of techniques: modern media--newspapers, magazines, radio, TV, and video cassettes; team competitions to examine knowledge about socialism; speech competitions; face-to-face lectures; backbone training classes; and mobilize masses to reminisce about the progress that has been made; and sponsor exhibitions. Government township and county cadres should have direct dialogues with peasants to solve concrete problems (4). Work teams were instructed not to punish cadres and citizens.

In mid-1991 authorities in Beijing reported that the socialist education movement had been initiated in about half of the villages in the country. After Deng Xiaoping's trip to south China in early 1992, authorities began to call on socialist

education cadres to use the program to push reforms in rural areas (7).

### ***Strengthen Party Branches***

Song Ping, from the Standing Committee of the Political Bureau of the CPC Central Committee, noted that in building a new rural order, party organizations "should be the nucleus;" village committees and economic cooperatives should be the "pillars;" and the Communist Youth League and the Women's Federation should be the "bridges" among the party, government, and the masses (9). The Organization Department of the Central Committee CPC recently reported that there are 3.14 million basic level party organizations and that about half of all party members live in rural areas.

After land was contracted out to households, many party branches became weak and paralyzed. A Hong Kong source reported that a Central Committee survey showed that only 25 percent of grassroots level units were sound or comparatively sound, 60 percent were "so, so" and 15 percent were of poor quality. In fact, of the senior party elders, Chen Yun, is reported to have said that the problem is far worse than the survey results indicated.

### ***Village Committees and Economic Cooperatives***

During the breakup of the commune system, some villages and economic cooperatives ended up with few resources, well trained leaders, assets, or and financial resources. During the socialist education program there were numerous articles on problems that villages with weak leadership had pursuing economic development. The primary problems were how to recruit able leaders and how to obtain investment funds to build collective service enterprises.

Authorities noted that leaders of village committees should be elected to their posts by voting members of their villages. Often in the past leaders were appointed by township authorities or local party leaders. But in 1991 there was a campaign to hold elections according to the Organization Law of Village Committees. In some cases village leaders lost their jobs because work teams uncovered illegal loans.

A recent national survey of 274 villages found that 54 percent had organized economic cooperatives. This implies that nearly half the villages do not have economic cooperatives, which means that village committees, and more likely party branches, are supervising economic affairs and managing the land contract system (12). There is no buffer between farmers and the party acting as landlord. Moreover, the few weak economic cooperatives will slow the development of collective service enterprises because personnel and funds are normally drawn from the cooperatives. Work teams are encouraging village leaders to establish economic cooperatives where none exist.

In the mid-1980's when communes were demobilized, government and economic functions were to be separated. Townships were to fulfill governmental functions and economic cooperatives were to manage rural economic affairs. But many areas have reported that government units have not separated these functions.

## **Effects of Policy on Production and Trade**

It is always difficult to forecast how certain policy measures will affect production, income, and trade. For each of the policy measures discussed above an attempt will be made to pull together the different policy threads to assess what effect implementation will have on production, income, and trade. For analytical purposes, production is divided into agricultural (primarily crop output) and non-agricultural (rural industry, commerce, transportation, and services). Income refers to total rural income from all sources. Foreign trade refers to both imports and exports. To provide some structure to the summary, see table E-1. Policy measures noted above are listed along the left side and production, income, and trade are listed as columns on the top. The general effect of a measure is indicated by a plus or a minus.

**Table E-1--Assessed effect of current policy measures on production, income, and foreign trade**

Policy measures	Production		Income	Foreign Trade
	Agriculture	Non-ag		
Land contract	+	+	+	+
Collective service				
Service goal	+	+	+	+
Control goal	-	-	-	-
Investment				
State	+	+	+	+
Collective	-	+	+	+
Family	-	+	+	+
Socialist education	-	-	-	-
Party branch	-	-	-	-
Economic coops	+	+	+	+

Improving the land contract system will be positive for agricultural production because efficient farm managers will be able to consolidate larger, more optimally sized production units through sub-contracting. Rural residents without the desire or aptitude to raise crops will be able to move into non-agricultural production. More efficient agricultural production and expanded rural industry likely will boost incomes. An improved land contract system likely will encourage specialization and will make production units more competitive, which will boost the gains in foreign trade.

Implementing the collective service policy could take two directions. First, China's leaders may aim to provide more services to farmers. In this case, inputs such as fertilizer and technology will increase agricultural and non-agricultural production and income. More efficient production should lead to expanded foreign trade. Exports from rural industrial enterprises likely would increase.

On the other hand authorities may use collective services to control rural economic behavior. During the commune period,

rural cadres were able to maintain discipline and order but were not able to increase output and incomes at the rates achieved during the reform period. Current cadres likely will not improve on their predecessors, consequently if the primary objective of the collective service system is to tighten the party's grip on the rural economy, then agricultural and non-agricultural output growth will be retarded. Incomes would likely be negatively affected also. Exports of products likely would slow and there would be greater need for food and feed grain imports.

Leading authorities have recorded their determination to invest a larger proportion of state revenues in the agricultural sector. These investments should boost agricultural and non-agricultural production, raise incomes, and promote trade.

Investments actually made in agriculture by collectives or individuals had a positive effect. But the important point is that on the whole this investment has not occurred because higher rates of return can be had by investing in rural industry and services. Consequently policies governing investments by collectives and individuals is judged to have a negative effect on agricultural production, but a strong positive effect on non-agricultural production. Incomes should rise primarily because of rising incomes from non-agricultural production. These investments should have a positive effect on trade.

While authorities will not be able to accomplish as much as they would like in the socialist education program, implementation will have a negative impact on production, income, and trade. Past socialist education campaigns were often linked with efforts to increase local political control measures, which had negative effects on the performance of the rural economy. The current campaign likely will have the same impact on the economy as previous campaigns. Note however that in recent months the movement seems to be stressing reforms which, in fact, may change many of the negative signs to neutral.

Authorities likely will have marginal success in building party branches. At present the Party's prime rural concern is stability. Given scarce personnel resources and the Party's prime objective to build party branches means that fewer resources can be devoted to economic affairs which will have a negative effect on production, income, and trade.

Officials likely will have marginal success in improving the operation of economic cooperatives. To the extent that economic cooperatives are well run and local officials have influence in making economic decisions, this policy measure should have a positive effect on both agricultural and non-agricultural production, income, and trade.

In summary, China's authorities during the past 40 years have formulated and implemented many different rural policies to achieve national objectives. Some policies, such as opening rural markets in the 1980's, promoted economic growth while other policies such as the Great Leap Forward (1958-1961), severely restricted growth. Because the two campaigns are ongoing and implementing specific policy measures will affect production, income, and trade, it will be well to continue monitoring and analyzing rural policy developments in China.

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# Rural Labor Force Trends in China

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**Abstract:** This article uses census data and annual administrative data to analyze trends in the size and structure of China's rural labor force. The article shows that rural jobs inside and outside agriculture have increased enough to employ the growing rural population of labor force ages, but that rural underemployment is a widespread problem. The analysis shows that migration has not yet provided a major outlet for surplus rural laborers. Future prospects are discussed.

**Keywords:** Employment, labor force, economically active, agriculture, surplus labor, underemployment, urbanization, migration, and floating population.

## Introduction

During the 1980's, China's population in labor force ages grew rapidly, about 2.6 percent a year, while the total population growth rate was kept under rather tight control at 1.5 percent a year<sup>1</sup> (this and subsequent superscript numerals designate endnotes). In most developing countries, swift increases in the adult population of employment ages are not accompanied by corresponding increases in meaningful employment. Rather, unemployment and marginal, informal work tend to proliferate, increasing the existing strains on developing societies. China launched its post-Mao economic reforms just in time to provide at least nominal employment for much of this rapidly expanding work force in the 1980's. We explore here not only the number of rural and urban jobs created each year, but also the quality and productivity of employment.

China experienced real urbanization during the last decade, partly through rural-to-urban migration but mostly through the transformation of rural places into booming central market towns and new cities. Local populations did not have to move to become urbanized. China's urban centers, old and new, drew some former agricultural laborers and a portion of the exploding cohort of entry-level workers seeking jobs.<sup>2</sup> Between the 1982 and 1990 censuses of China, the urban (*shi* and *zhen*) population increased from 21 to 26 percent of the total population, based on a conservative definition of urban population.

Such urbanization has absorbed some of China's vast rural surplus labor force into urban, nonagricultural jobs. But the People's Republic of China, for all its rapid economic development since 1978, is still at an early stage of modernization and transformation of its labor force. Today, 74 percent of China's total population lives in rural areas, and 74 percent of the employed population is classified as rural.

This article focuses on recent trends in employment, unemployment, surplus labor, and labor migration in rural China. We trace the surges and setbacks in the transformation of this huge rural work force as it emerges from traditional agriculture into a modern, diversified rural employment structure.

## China's National Employment Pattern

China gathers two main types of employment data and both are utilized in this report. At the end of each calendar year, local economic units report the number of workers employed in agriculture and various nonagricultural sectors of the economy. These figures are collected by the administrative hierarchy and provide regular, annual data on China's rural, urban, and total employment structure. The other main category of employment figures is census data from the full population censuses of 1982 and 1990, supplemented by the 1 percent sample census of 1987.<sup>3</sup> Table F-1 shows the rural and urban components of China's midyear 1990 employed population as reported in 1990 census data, and as averaged from year-end 1989 and year-end 1990 annual employment figures.

Census figures report more people as employed than do annual employment figures, in part because administrative data apply only to men ages 16-59 and women ages 16-54, while census data refer to all persons age 15 and older. An additional source of discrepancy is that China's censuses count as employed any adult who was reported as working at least half of the month before the census, which is always June, probably a peak agricultural month in most places. Therefore, workers who spend part of the year in nonagricultural work or no remunerative work but join agriculture in peak seasons might be labeled agricultural workers by the censuses, while regular employment statistics might call them nonagricultural workers or not employed at all. In general, regular employment figures are based on a narrower definition of who is employed in agriculture, education, and government than the census figures, but a broader definition of who is working in industry, construction, and transport.

Both sets of employment figures in table F-1 show that agricultural employment is, naturally, highly concentrated in rural areas, and that in most nonagricultural employment categories, jobs are in urban areas. But of industrial jobs in China, about one-third are in rural areas. One-quarter of jobs in commerce, and 30 percent or more of transport jobs are rural.

Employment figures in table F-1 indicate that China still has a traditional production structure. A large proportion of the employed population works in the primary sector called

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Table F-1--China's rural and urban employment, by sector, midyear 1990

Category	Census data					Administrative labor statistics				
	Total	Rural	Rural percent of sector	Urban	Urban percent of sector	Total	Rural	Rural percent of sector	Urban	Urban percent of sector
Employed population in 1,000s										
Total employed population	647,200	480,800	74	166,400	26	560,347	414,742	74	145,605	26
Agriculture	467,926	428,163	92	39,763	8	337,302	328,885	98	8,418	2
Industry	86,617	25,191	29	61,426	71	96,324	32,422	34	63,902	66
Geological surveys	658	93	14	565	86	1,021	--	--	--	--
Construction	11,890	3,508	30	8,382	70	24,524	15,123	62	9,401	38
Transport, post & telecomm.	11,814	3,609	31	8,205	69	14,505	6,248	43	8,257	57
Commerce, catering & supply	25,631	7,168	28	18,463	72	28,989	6,728	23	22,261	77
Real estate & urban services	6,154	1,228	20	4,926	80	6,142	1,531	25	4,611	75
Health, sports & welfare	5,128	1,422	28	3,706	72	5,267	1,344	26	3,923	74
Education, art, broadcasting	15,094	6,886	46	8,208	54	14,424	3,082	21	11,342	79
Scientific research	1,491	63	4	1,428	96	1,692	190	11	1,503	89
Finance & insurance	2,114	508	24	1,606	76	2,119	223	11	1,896	89
Gov't & party organizations	12,575	2,940	23	9,635	77	10,505	1,435	14	9,070	86
Other	109	20	18	89	82	17,535	17,535	100	0	0

"--" represents zero or negligible.

<sup>1</sup> Administrative employment data for year-end 1989 and year-end 1990 are averaged to estimate figures for midyear 1990 for comparison with midyear census data. Employment in agriculture is made up of the following components in 1990 census figures: 97.9% farming, 0.4% forestry, 0.7% animal husbandry, 0.5% fishing, 0.1% water conservancy, and 0.3% agricultural services.

Sources: China 1990 Census 10% Sample, 1991, pp. 207-210, 289-298, 319-328; China Statistical Yearbook, 1990, pp. 110-111; 1991, pp. 81-82.

agriculture, which is almost all farming but also encompasses comparatively small numbers of workers engaged in animal husbandry, fishing, forestry, water conservancy, and services to agriculture.<sup>4</sup>

The two full censuses recorded very little change in the structure of employment for the total population between 1982 and 1990 (11,12). Employment in the primary sector decreased slightly from 74 percent of the total to 72 percent between the two censuses, while the secondary sector (industry and construction) engaged 16 percent of total employed people in 1982 and 15 percent in 1990. Census data showed only a small increase in tertiary (service) sector employment from 11 percent of total employed people in 1982 to 12 percent in 1990.<sup>5</sup>

However, annual year-end reported figures indicate much greater change in the structure of China's national employed population (13,16). According to annual data, employment in the primary sector (agriculture) decreased from 71 percent of all jobs in 1978 to 68 percent in 1982, and further to 60 percent in 1990 and 1991. Meanwhile, employment in industry and construction grew from 17 percent of all jobs in 1978 to 18 percent in 1982 and 21 percent in 1990 and 1991. A great increase reportedly occurred in the tertiary sector. Service jobs constituted 12 percent of employment in 1978; the proportion rose slowly to 13 percent in 1982 and then rapidly to 19 percent in 1990 and 1991. Even though census data and year-end reported figures are clearly discrepant, both sets of data

confirm that agriculture still employs between 60 percent and 72 percent of the total employed population.

### China's Labor Force from an International Perspective

China's economically active population is an unusually high proportion of adults, in comparison to almost all other countries (table F-2). The economically active portion of a population includes not only those presently employed but also those unemployed and seeking work. The nonactive portion of a population includes homemakers, students, retirees, handicapped persons who are outside the labor force, volunteers, and others who receive no compensation for their activities. According to 1982 census data, the percentage of China's total population age 15 and over that was economically active was 90 percent for males, 74 percent for females, and 82 percent for the population overall (17). Based on 1990 census data, the economically active portion of men age 15 and above had declined to 86 percent, females remained at 74 percent, and the total population decreased to 80 percent (12). These figures are still very high from an international perspective, as shown by figures for the total populations age 15 and above in China and other countries.

Some other agricultural developing countries have the same high labor force participation rates for men as China. But in most countries, a lower proportion of men is economically

**Table F-2--Economically active adult population, selected countries**

Place	Date	Percent economically active		
		Total	Male	Female
China	1990	80	86	74
Vietnam	1989	77	82	74
Indonesia	1989	66	81	52
E. Europe	1980's	61-68	72-77	50-61
Asian NICs	1980's-1990	57-66	75-82	40-51
Developed	1980's-1990	54-64	64-80	43-56
Brazil	1987	64	85	43
Bangladesh	1985-86	50	89	10
Pakistan	1990-91	49	75	11
Egypt	1986	44	77	10

Sources: ILO, Yearbook of Labour Statistics 1991, 5, pp. 17-50; and Vietnam Central Census Steering Committee, *Tong Dieu Tra Dan So Vietnam*, 1989, p. 62.

active than in China, for various reasons including greater availability of higher education, lack of economic opportunities, access to welfare systems, and more retirement options than in China. China is most unusual with regard to women's economic activity rates. The only countries that report similarly high labor force participation rates for women are other developing Communist countries.

### Labor Force Participation by Sex

According to China's 1990 census data, males account for 55 percent and females 45 percent of China's civilian labor force. There are substantial differences in the sex composition of the labor force between regions. Women are only 41 percent of all economically active persons in the Northeast, but constitute 47 percent in the Southwest. The labor force participation rate among men age 15 and over in every province lies within the narrow range of 82 to 90 percent, while female economic activity rates vary from a low of 56 percent in Heilongjiang to a high of 82 percent in Yunnan, Sichuan, and Guizhou. Across regions, the average female activity rate of 81 percent for the Southwest is substantially higher than the 61 percent for the Northeast.

The reasons for these differences are as follows. First, women have traditionally been important in agricultural work in China because of custom as well as survival needs. In those parts of China where nonagricultural production is more important, such as the more urbanized provinces of the Northeast, women's labor force participation rates are lower. Activity rates are higher in poorer provinces than richer ones, perhaps because fewer machines and draught animals are available to substitute for human labor in poor regions.

Comparing China's urban and rural labor force, 1990 census data show that the percent of China's population age 15 and over employed in urban areas is 79 percent of males, 65 percent of females which averages out to 72 percent for the

urban adult population. In the rural areas, an even higher proportion of the population is employed: 87 percent of males age 15 and above, 76 percent of females which averages out to 82 percent for the total rural population.

### Unemployment

China does not gather statistics on unemployment in internationally standard categories. Because of constraints imposed by the available data, China's labor force in this paper is defined as the sum of employed persons and two reported classes of unemployed persons: persons awaiting jobs in urban areas and "other," nonworking individuals (17).<sup>6</sup> These categories may not pick up all those in rural areas who are actually unemployed.

Given the inadequate data available, unemployment in China appears to be an almost completely urban phenomenon. Based on 1990 census data, the unemployed as a percent of the total labor force in 1990 was 3.4 percent in cities and 5.6 percent in urban towns, in contrast to only 0.7 percent in rural areas. Labor departments in China report that they have provided 21 million urban jobs during 1989-1991, and that the urban unemployment rate has remained below 3 percent in the past few years, calculated according to regularly reported annual data (1).

China's total labor force as of midyear 1982, as defined above using 1982 census data, was 546 million persons, 520 million of whom were employed, and an estimated 27 million of whom were involuntarily unemployed (17).<sup>7</sup> In 1982, therefore, about 5 percent of China's labor force was unemployed. By midyear 1990, based on comparable data from the 1990 census, China's labor force totaled 657 million persons, 647 million of whom were employed and an estimated 10 million of whom were involuntarily unemployed. By this calculation, the unemployed constituted only 2 percent of China's 1990 labor force.

### Rural Employment Trends

Growth in rural employment averaged 2.6 percent a year from the beginning of China's economic reform period in 1978 through 1990, based on annual year-end employment figures. Total employment growth was strong each year. Table F-3 shows rural employment trends from midyear 1982 to midyear 1990, based on both census data and annual statistics. Census figures indicate that almost all the increases in rural employment over these 8 years were in agriculture; this suggests that China achieved essentially no modernization of its rural employment pattern, and that the only transformation out of agriculture was to urban jobs. Many rural localities were, however, reclassified as urban during the intercensal years, so that their nonagricultural jobs became "urban."

Year-end employment figures confirm that many of the added jobs in rural China were in agriculture. From 1978 to 1990, 58 million additional rural agricultural workers were added to the 275 million already working in the fields, pastures, forests, and fisheries. Those employed in rural agriculture increased at 2.2 percent a year during 1978-82 and 1.3 percent a year during 1982-90.

**Table F-3--China's rural employment trends, midyear 1982 and 1990**

Category	Census data				Administrative labor statistics			
	1982	1990	Difference, 1982-1990	Average annual percentage change	1982	1990	Difference, 1982-1990	Average annual percentage change
1,000s of workers								
Total employed population	407,184	480,800	73,616	2	332,695	414,742	82,047	3
Agriculture	357,361	428,163	70,802	2	295,210	328,885	33,675	1
Industry	24,823	25,191	368	0	20,270	32,422	12,152	6
Geological surveys	234	93	(141)	(12)	--	--	--	--
Construction	4,108	3,508	(600)	(2)	3,380	15,123	11,743	19
Transport, post & telecomm.	2,117	3,609	1,492	7	1,080	6,248	5,168	22
Commerce, catering & supply	5,629	7,168	1,539	3	790	6,728	5,938	27
Real estate & urban services	482	1,228	746	12	465	1,531	1,066	15
Health, sports & welfare	1,839	1,422	(417)	(3)	800	1,344	544	6
Education, art, broadcasting	7,464	6,886	(578)	(1)	2,490	3,082	592	3
Scientific research	133	63	(70)	(9)	150	190	40	3
Finance & insurance	442	508	66	2	105	223	118	9
Gov't & party organizations	2,440	2,940	500	2	350	1,435	1,085	18
Other	110	20	(90)	(21)	7,605	17,535	9,930	10

--Represents zero or negligible and ( ) represents a negative number.

Sources: China 1982 Census, 1985, pp. 424-427; China 1990 Census 10% Sample, 1991, pp. 319-328; China Statistical Yearbook, 1990, pp. 313-314; and China Statistical Yearbook, 1991, pp. 281-282.

Annual employment figures tell us that rural employment outside agriculture started from the small base of only 32 million jobs in 1978 but grew rapidly at an average rate of 8.4 percent a year to 87 million jobs in 1990. Rural nonagricultural employment growth was brisk during 1978-1988, averaging 10 percent a year, but slowing down to 6 percent in 1988. During economic retrenchment in 1989, jobs in rural industry declined by 1.6 million and employment stagnated in other non-agricultural sectors. In 1990, rural industry and construction employment held steady, and rural job growth was primarily in agriculture, with small gains in transport and commerce. During 1991, 2.3 million rural nonagricultural jobs were added, for a growth rate of 2.7 percent, and 8.5 million more rural agricultural jobs were reported, for 2.5 percent growth (16).

Census and regular statistics agree that a very high proportion of those employed in rural areas are still in agriculture, 79 to 89 percent. As of 1990, rural industry had absorbed only 5-8 percent of those working in the countryside, construction no more than 4 percent, transport 1-2 percent, commerce 2 percent, and education 1 percent.

### The Quality of China's Rural Labor Force

Though this picture looks fairly backward at first glance, it masks some positive trends that should be noted. First, in the 1980's, China was able to generate rural employment as fast as the rural population in labor force ages grew, though much of the employment growth was in agriculture.

According to a 1992 report given by the rural survey team of the State Statistical Bureau, the quality of the rural labor force has improved in myriad ways (6). In the eastern coastal area, the number of employees in the secondary sector (industry and construction) increased 21 percent between 1985 and 1990. In the central and western areas, the increase was 26 percent and 23 percent, respectively. In the eastern coastal area, total tertiary (service) sector growth between 1985 and 1990 was 38 percent, and in the western area, over 40 percent.

The State Statistical Bureau also reports that, according to the rural sample surveys, the educational level of rural workers has improved. From 1985 to 1990, among rural workers, those who have some junior high school education increased from 28 to 33 percent, and those whose education ended in elementary school increased from 37 percent to 39 percent. The illiteracy rate of rural workers dropped from 28 percent to 21 percent. The comprehensive educational index of employed rural workers rose from 5.6 years of education to 6.2 years of education. Data from the State Statistical Bureau rural survey team show that, in general, the educational level of those rural laborers in the secondary and tertiary sectors is above junior high school, which is much higher than that of the labor force in the rural areas.

Agriculture itself has become more mechanized, diversified, and specialized. Currently, half of the cultivated land in China is tilled by machines (9). China's output of chemical fertilizer and pesticides ranks as the third highest in the world. Total

Table F-4--China's crop production per standard labor day, 1978, 1985, and 1988<sup>1</sup>

Crop	Crop yield (kg/hectare per year)			Average standard labor days (per hectare per year)			Output (kg) per average standard labor day		
	1978	1985	1988	1978	1985	1988	1978	1985	1988
<b>Grain crops:</b>									
Rice	4,176	5,653	5,597	572	328	317	7.3	17.2	17.7
Corn	3,425	4,453	4,698	467	245	248	7.3	18.2	18.9
Soybean	1,307	1,463	1,430	333	174	174	3.9	8.4	8.2
Wheat	2,351	2,977	2,957	461	218	202	5.1	13.7	14.6
<b>Industrial crops:</b>									
Cotton	577	906	799	908	643	616	0.6	1.4	1.3
Sugarcane	51,278	78,354	70,301	978	752	683	52.4	104.3	102.9
Tobacco	2,119	2,279	2,089	1,259	824	757	1.7	2.8	2.8
<b>Oil-bearing crops:</b>									
Peanuts	1,687	2,223	2,041	536	352	347	3.1	6.3	5.9
Rapeseed	1,017	1,298	1,269	456	280	264	2.2	4.6	4.8
Sesame	619	774	591	335	185	149	1.8	4.2	4.0

<sup>1</sup> The Ministry of Agriculture conducts an annual nationwide survey that gathers information on the hours of work actually expended per mu of land to grow each type of crop. They then assume that a standard labor day is eight hours long and divide the total hours devoted to that crop by eight. This technique should give reasonable weights to the labor used on fields of different quality, in different climate belts, with and without irrigation, and with laborers of different strength and skills.

Sources: China Rural Statistics Yearbook, 1985, pp. 154-168; 1987, pp. 161-166; 1990, pp. 180-185.

utilization of chemical fertilizer in China is double the amount used 10 years ago. In China, about 80 percent of the households in rural areas have electricity. More than half of the total cultivated land in China is irrigated. Technologies such as sprinkling and drip irrigation, as well as plastic-sheet-covered cultivation, have been widely practiced. So China's agricultural workers have in general moved beyond simple subsistence farming methods.

## Surplus Rural Labor Force

Though there has been some improvement in the quality of China's rural labor force, there remains an enormous number of rural workers growing crops at a low level of productivity (underemployed workers). Table F-4 shows that the output per day of work in crop production markedly improved in the first half of the 1980's but has leveled off since then. For each average standard labor day of work in agriculture, the output of rice, corn, soybeans, wheat, cotton, sugarcane, peanuts, rapeseed, and sesame seeds at least doubled between 1978 and 1985, but then essentially stopped increasing. There was almost no increase in annual grain production per crop farmer between 1985, 1,192 kg, and 1989, 1,245 kg (15).

China's rural surplus labor force is estimated to be between 60 million and 200 million workers (19,22).<sup>8</sup> In each of the past few years, agricultural laborers have on average worked fewer than 100 standard labor days. The "hidden unemployment rate," referring to those who are supposedly working but have essentially no productive work to do, is estimated by some

observers to be 40 percent of the rural labor force (25). We calculate that each grain farmer in China worked on average only 79-82 standard labor days annually from 1985 through the late 1980's.

What are these farmers doing the rest of the year? In some areas, there is no other useful work, and they are idle. In other areas, however, farmers in China may engage in productive forms of labor in addition to crop production, for example, building houses or upgrading their homes, building roads, tending livestock, trading, handicrafts, transport, or other part-time remunerative work. Because the available data are inadequate to document such multiple economic roles, estimates of the number of surplus rural laborers in China are imprecise. Most observers note that it is in the least developed rural areas where high proportions of farmers are underemployed. It is estimated that in rural China as a whole, 28 percent of the employed population is surplus workers, composed of 23 percent in developed areas of the countryside, 27 percent in semi-developed areas, and 41 percent in undeveloped areas (3).

Relatively few rural workers who leave agriculture find employment in urban areas. During 1985-88, each year only 1.5-1.7 million urban jobs were assigned to rural laborers. Urban employment of rural workers hit a low point in 1989 and 1990 when 1.2 million urban jobs per year went to rural workers. There was a slight rebound in 1991, when rural workers were given 1.4 million urban jobs, 18 percent of the 7.65 million urban jobs assigned that year (16).

Table F-5--China's migration from rural areas, 1982-90

Migrants by sex	1987 sample census (1982-87 data)				1990 census (1985-90 data)			
	Total rural- to-urban	Total urban- to-rural	Net rural- to-urban	Rural-to- rural	Total rural- to-urban	Total urban- to-rural	Net rural- to-urban	Rural- to-rural
1,000 migrants								
Total	15,467	1,909	13,558	5,314	16,423	1,403	15,020	4,758
Male	6,833	851	5,982	1,347	9,126	991	8,135	1,942
Female	8,634	1,058	7,576	3,967	7,297	413	6,885	2,816

Sources: China 1987 1% Sample Census, 1988, p. 677; China 1990 Census, 10% Sample, 1991, pp. 484-485, 676-677.

China's policy is to employ near their rural homes as many workers leaving agriculture as possible. During 1986-1990, town and township enterprises reportedly absorbed 22 million surplus agricultural laborers, an average of four million per year (21). In 1989, 20 percent of the 1.7 million laborers who were sent back by the authorities to rural areas from the urban areas got involved in town/township construction work and 50 percent of them were placed in the town/township enterprises (25).

Observers in China classify into three levels the transfer of rural laborers to more productive work. A transfer from growing grain to industrial crops is considered a lower level transfer; a middle level transfer is one from crop growing to forestry, animal husbandry, fishery, and agricultural sidelines; and a higher level transfer is one from agriculture to nonagriculture. In developed areas, 80 percent of those who leave grain production transfer to nonagricultural sectors (higher level transfer) while 20 percent transfer within agriculture (lower and middle level transfers). In semi-developed areas, almost half transfer to nonagricultural sectors (higher level transfer), and of the 52 percent who transfer within agriculture, most are transferred to agricultural sectors other than crop growing (middle level transfer). The transfer out of grain production in undeveloped areas still occurs mainly within agriculture, particularly within crop growing (lower level transfer) (3).<sup>9</sup>

## Migration of Rural Laborers

For decades, migration out of rural areas has been tightly restricted through the use of the permanent population registration system, location-specific rationing, restrictions on the use of long-distance transport, and police surveillance in urban areas. Under the economic reforms of the 1980's, however, there has been some easing of the barriers to movement. Certain individuals have received permission to move permanently from rural to urban areas, and many more have been allowed to travel "temporarily" for economic reasons.

In the 1980's, several surveys were done on migration. The 1 percent sample census of 1987 investigated migration in the 5 year period from mid-year 1982 to mid-1987. A "migrant" was defined as anyone who had changed permanent registration to the place of current residence, or who had been in the present residence location for 6 months or more without moving household registration from another place. The 1990 census

gathered similar data for the period from mid-year 1985 to mid-1990, except that only those who had been in the present residence location for 1 year or more were counted as migrants. In both censuses, only moves across the boundaries of cities, counties, or urban towns were counted as migration--a move within a city or a county would not be recorded.

Table F-5 presents migration data for 1982-87 and for 1985-90 from the two censuses. The 1987 sample census detected net rural-to-urban migration of only 13.6 million people in the previous 5 years. This constituted 1.7 percent of China's 1982 rural population, which suggests that rural-to-urban migration did not provide much of an outlet for rural surplus laborers.

The 1990 census got similar results. The census detected net rural-to-urban migration of 15.0 million people for 1985-90, equivalent to 1.9 percent of China's 1985 rural population.

Rural-to-rural migration has been less restricted. One outlet for surplus laborers in poverty-stricken rural areas might be to move to more prosperous rural areas. Yet long-term rural-to-rural migration has been minimal in the 1980's (table F-5). Only 0.7 percent of China's 1982 rural population made a long-term move to a different county by 1987. Between 1985 and 1990, 0.6 percent of the 1985 rural population had moved permanently to another rural area.

Why is there so little rural-to-rural migration? First, it is still difficult for a worker to get authorization to change legal residence and move spouse and children to another location, even another rural place. Second, China's peasants are accustomed to having access to their own contract land, even though technically the ownership is still collective. But if they move, they get no land and will become hired laborers without the security that comes with land rights. There is no land market. Therefore, rural-to-rural as well as rural-to-urban moves are infrequent. All the figures in table F-5 indicate that China's population remains highly immobile.

## China's Floating Population

If permanent migration has not been a major outlet for surplus workers, what about temporary migration, commuting, seasonal migration, or other forms of "circular migration?" The statistics on such labor movement are particularly poor (2). In the

censuses, the mobile people who had been away from their registration location less than 1 year (or 6 months in the case of the 1987 sample census) were enumerated, but they were allocated to their place of registration. The census volumes provide no data on this short-term floating population.

Certain cities have conducted surveys of their floating populations, but these fragmentary data do not add up to a national picture. The size of the floating population--that is, the population away from their residence location for a short or long time--was estimated to have increased from 30 million in 1982, to 40 million in 1985, and to 70 million in 1988 (10). A report on the 1990 census stated:

The recent census showed that a floating population of more than 21 million had left their registered permanent residences for more than a year, while the figure rose to 70 million when it included those absent for less than a year (24).

A floating population of 70 million would constitute 6 percent of the 1990 total population of China. Some sources report that this is primarily a rural-to-urban population flow, whether or not the "drifters" cross provincial boundaries (4).

What are the characteristics of those who informally leave their rural homes and join the "floating population" for economic reasons (23)?<sup>10</sup> Most are young adults ages 15 to 34. Males outnumber females. In many areas, males account for 75-85 percent of the total out-flow. The number of females who migrate out correlates with the degree of openness of their home areas; the richer and more open their areas, the more likely females are to go to other places to work. From poor rural areas, relatively richer peasants are twice as likely to leave and find jobs elsewhere as poor peasants.

Most out-migrants from rural areas have had some elementary or junior high school education (23). However, educational attainment is not an absolute requirement for joining the floating population of workers. For example, in Guangdong province, most migrants are young adults with very little education. According to a survey conducted in Dongwan City, most of the migrant workers there are between 16 and 30 years of age, and 60 percent are females. They have low levels of education; 87 percent did not graduate from junior high schools, and can perform only simple and low quality labor (7).

In recent years, the main response by the national government and by the receiving city governments to the floating population has been to try to reverse the flow and send the would-be migrants back to their villages. Since the beginning of the economic retrenchment in late 1988, cities have laid off construction and factory workers from rural areas and sent them out of the city. Cities such as Guangzhou have been trying to send millions of annual in-migrants back to their home provinces. Hainan Island in 1989 conducted a concerted "fight against the influx of transient laborers," tracking down 450,000 and sending more than 200,000 of them "back where they came from" (2). Though in theory, labor out-migration is necessary in order to solve the problem of surplus workers in economically depressed areas, China suffers from an acute shortage of places where labor can be productively employed.

The sending provinces and localities are, however, pleased with the labor outflow. For example, Sichuan province promotes out-migration of floating workers and arranges for the employment of 40 percent in other provinces (8). Some provinces, such as Gansu, have had more luck arranging intra-provincial labor migration than locating jobs in other provinces for their surplus rural workers.

Can out-migration provide opportunities for the surplus laborers in China's poor rural localities? On the one hand, the national and some provincial governments have recently irrigated new land and organized wholesale transfers of populations of arid villages to the reclaimed land. This pattern of out-migration has worked well in a few places. On the other hand, the prevailing official attitude seems to be that China has so little cultivated land even the poorest agricultural land must continue to be tilled. So, for example, instead of rejoicing when residents of poor mountain villages move to nearby developed plains areas, the official media lament the abandonment of the formerly cultivated mountain fields (2). Because of the strong policy bias against population and worker migration, in the near future it will be difficult to use out-migration as the chief solution for China's rural surplus labor.

To allow vastly more rural-to-urban migration in China is a feasible strategy, however (2). China now has a fairly dense network of urban places, cities, and urban towns all over the country, that could absorb a steady stream of in-migrants, especially if China's economic reforms and the booming economic growth of the early 1980's are successfully renewed and expanded. In fact, cities and towns in China can more effectively absorb rural migrants than urban areas in most developing countries. There is a huge demand for services among China's urban population that is only just beginning to be met. Many millions of service workers are needed for retail trade, cleaning, child care, delivery, and personal services of almost every kind. In addition, urban demand for rural laborers in China is great because peasants have shown themselves to be more flexible than native urban dwellers regarding types of jobs, conditions of work, pay scale, and minimal benefits.

Demographic trends in urban areas also favor rural-to-urban migration. Fertility in the urban population has been low since 1966 and extremely low since the early 1970's. By the mid-1980's, smaller cohorts began reaching working ages, and future cohorts of city-born entrants to the work force will be even smaller. Without in-migration, China's urban population ages 15-29 would decline precipitously in size between 1990 and 2000. In the great majority of China's urban places, a steady stream of young adult migrants from rural areas would merely offset the declining numbers of urban-born work force entrants.

Finally, the future aging of China's urban population is expected to be very pronounced. Large-scale migration of young workers, especially those with young children, from rural to urban areas can help alleviate the severe aging that is predicted.

Much more rural-to-rural migration is also feasible. Some of China's more developed areas of the countryside have created so many nonagricultural jobs that outsiders have been hired to

work in the enterprises or take over agricultural tasks. Future economic development in rural China could provide more such opportunities. But in order for laborers to go where there is work, it would be necessary to ease China's rigid permanent population registration and barriers to movement.

## Conclusions

China's population of labor force ages grew rapidly during the 1980's. The economic boom of the reform period helped China generate enough jobs to meet the demand, but many of those jobs were in agriculture, and the problem of under-employment worsened. China's farms now employ tens of millions, some calculate hundreds of millions, of surplus laborers.

China's working age population will increase much more slowly in the 1990's, a lagged-benefit effect of declines in the average number of births per woman. The steep rural fertility decline of the early 1970's, along with further fertility reduction in urban areas, generated much smaller birth cohorts by the mid-1970's. They are just now reaching working age. In the mid-1990's, China will have only 8-10 million net additional persons of working age each year, in contrast to 16-21 million annually in the mid-1980's (2). China is thus in an advantageous situation in its attempts to employ its growing population, in contrast to most developing countries whose fertility levels have not declined as far. Despite this progress, the population of working age in China continues to grow. New nonagricultural jobs are needed for these incremental additions to China's labor force age groups. Besides, today's surplus workers need more productive work. Though the difficulties of providing enough useful jobs will ease in the coming years, the remaining challenges are still daunting.

According to official figures, the urban population of China grew from 21 percent of China's total population in 1982 to 26 percent in 1990. Only a small amount of this increase can be attributed to net rural-to-urban migration. China's urbanization during the reform period has resulted from the formal establishment of 273 cities and over 9,000 urban towns. Urban areas have not provided much of an outlet for the surplus rural workers. China's population remains in general a geographically immobile population. Only 3 percent of the population reported having moved permanently in the last 5 years of the 1980's. At any one time, only 6 percent of the people are away from their designated registration location for any reason, including personal, family, medical, educational, or work-related reasons. Some people have managed to migrate, but migrants are subject to considerable harassment. Prevailing official attitudes at the national level and in the receiving localities discourage migration. Except for this very serious impediment, massive rural-to-urban and rural-to-rural migration is a feasible partial solution for alleviating the problem of surplus labor in China's rural areas, especially the poorer regions.

The stronger China's economic growth is in the 1990's, the more it will be possible to generate nonagricultural work. Though urban areas could provide jobs for millions of rural out-migrants each year, millions will also require jobs in the rural areas. Agriculture needs no more workers, though this sector would benefit from raising the quality of its work force.

The creation of rural nonagricultural jobs remains a key solution to the problem of rural underemployment.

## Endnotes

1. China defines labor force ages or employment ages as ages 16-59 for men and 16-54 for women. But in rural areas, people begin to work younger and many continue working into older ages. So we also utilize the international standard labor force ages 15-64 in this article.
2. A "cohort" is all those born in the same year.
3. Employment data from the censuses are categorized both by "industry" and by "occupation." For comparability with annual employment data, we use the industry breakdown, but the differences between the two census categorizations are marginal in any case.
4. Under the rural people's communes, village-level industry used to be included in agriculture. Now village industry is included in industry, and all the annual statistics used in this report for 1978 through 1991 have been recalculated by China's State Statistical Bureau using the new definition. In the 1982 census, perhaps some village industry was classified under agriculture in the industrial classification, but not in the occupational classification. No matter which classification is used, there is very little change from 1982 to 1990 in the proportion of the population in agriculture.
5. Percents do not add to 100 because of rounding.
6. This definition will overstate China's labor force to the extent that handicapped and imprisoned nonworkers in the "other" category are included, but should not be considered economically active. On the other hand, it will understate the labor force to the extent that it does not include persons who have resigned yet seek work--a category of nonworker that the census questionnaires lump together with retirees, who are clearly not in the labor force.
7. These figures do not appear to add up because of rounding.
8. Rural surplus labor force is defined as the number of farmers engaged in crop production whose labor is not needed and does not add to output. It is calculated several different ways. In general, it is estimated that, given the land available for growing a crop and the current level of mechanization and chemical fertilizer use, a certain number of standard labor days are required each year to produce the current output. On the assumption that one farmer could work 300 standard labor days per year, the required number of workers is then calculated. Surplus labor force is the excess of actual workers over the required number (18). This calculation does not take account of peak labor needs at certain times of year.
9. According to Deng's article, areas considered semi-developed include the rural areas of Hebei, Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Fujian, Jiangxi, Henan, Hubei, Hunan, and Sichuan; areas considered

developed include Beijing, Tianjin, Shanghai, Jiangsu, Zhejiang, Liaoning, Shandong, and Guangdong.

10. In this analysis, we are not considering people who leave their permanent registration locations for other reasons, for example, to get specialized medical care or to have an unauthorized pregnancy and birth.

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### Conversion Equivalents and Definitions

China	Metric	English	
1 mu	0.0667 ha		0.1647 acre
15 mu	1.0 ha		2.4711 acre
1 jin (catty)	0.5 kg =	.0005 ton	1.1023 lbs
1 dan (100 jin)	50.0 kg =	.05 ton	110.23 lbs
1 dun (ton)	1,000.0 kg =	1.00 ton	2,204.6 lbs
1 jin/mu	7.5 kg/ha	6.93 lbs./acre	
Crops:	Lbs./bu.	1.0 bu.	1.0 ton
Wheat, potatoes, soybeans	60	0.02722 ton	36.743 bushels
Rye, corn, and sorghum	56	0.02540 ton	39.368 bushels
Barley	48	0.02177 ton	45.929 bushels
Oats	32	0.01452 ton	68.894 bushels
Cotton (480-lb bale)	NA	NA	4.593 bales
Cotton (500-lb running bale)	NA	NA	1.409 bales

Exchange rate:

In 1991 U.S. \$1.00 averaged 5.3234 yuan.

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Appendix table 1--China's grain area, yield, and production, 1987-91<sup>1</sup>

Unit	1987	1988	1989	1990	1991
Million hectares					
Sown area					
Wheat	28.80	28.79	29.84	30.75	30.95
Rice	32.19	31.99	32.19	33.06	32.60
Coarse grains	26.63	25.82	26.17	27.01	26.98
Corn	20.21	19.69	20.35	21.40	21.57
Sorghum	1.86	1.79	1.63	1.55	1.40
Millet	2.69	2.51	2.40	2.28	2.23
Barley	1.29	1.25	1.22	1.21	1.20
Oats	0.59	0.58	0.58	0.58	0.58
Potatoes	8.87	9.05	9.10	9.12	9.00
Others <sup>2</sup>	14.78	14.47	14.39	13.52	12.79
Total <sup>3</sup>	111.22	110.12	112.21	113.50	112.31
Tons/hectare					
Yield <sup>4</sup>					
Wheat	2.98	2.97	3.04	3.19	3.10
Rice	5.41	5.29	5.51	5.73	5.64
Coarse grains	3.51	3.56	3.49	4.13	4.14
Corn	3.91	3.93	3.88	4.52	4.58
Sorghum	2.91	3.14	2.72	3.67	3.50
Millet	1.69	1.76	1.57	2.01	1.79
Barley	2.89	3.19	2.93	3.25	2.88
Oats	1.11	1.19	1.08	1.17	1.12
Potatoes	3.18	3.01	3.00	3.01	2.95
Others <sup>2</sup>	1.39	1.40	1.25	1.45	1.34
Total <sup>3</sup>	3.02	3.58	3.63	3.93	3.88
Million tons					
Production					
Wheat	85.84	85.43	90.81	98.23	96.00
Rice	173.88	169.11	180.13	189.33	183.81
Coarse grains	95.80	94.21	93.47	111.68	111.78
Corn	79.15	77.35	78.93	96.82	98.77
Sorghum	5.43	5.59	4.44	5.68	4.90
Millet	4.54	4.41	3.75	4.58	4.00
Barley	6.04	6.18	5.69	3.93	3.46
Oats	0.64	0.67	0.66	0.68	0.65
Potatoes <sup>5</sup>	28.22	27.23	27.30	27.43	26.55
Others <sup>2</sup>	20.53	20.27	18.00	19.57	17.10
Total <sup>3</sup>	402.04	394.41	407.55	446.24	435.24

<sup>1</sup> Data are official figures released by the SSB or the Ministry of Agriculture, except for: (1) 1990 total and individual coarse grain production; and (2) 1990 barley and oats, and other grain area and production.

<sup>2</sup> Consists of soybeans, pulses, and other miscellaneous grains. All of these items are included in China's definition of total grains.

<sup>3</sup> PRC definition.

<sup>4</sup> Calculated from area and production figures.

<sup>5</sup> Converted to a grain-equivalent weight using a 5:1 conversion ratio.

Sources: China Agriculture Yearbooks, 1988-91; China Statistical Yearbooks, 1988-91; and China Statistics Abstract, 1992.

Appendix table 2--China's 1991 provincial grain, cotton, oilseed crop, sugar crop, and red meat production

Province	Grain	Cotton	Oilseed crop	Sugar crop	Red meat
1,000 tons					
Northeast:					
Heilongjiang	21643	0	152	6,203	552
Liaoning	15324	42	203	586	888
Jilin	18,989	0	435	1,096	468
North:					
Shandong	39168	1351	2331	73	2071
Hebei	22,687	634	729	230	1311
Beijing	2797	3	33	0	248
Tianjin	1985	25	45	0	106
Henan	30103	948	1276	67	1413
Shanxi	7424	112	298	678	333
Northwest:					
Shaanxi	10470	90	354	93	503
Gansu	6576	12	325	1036	415
Nei Monggol	9585	0	718	3028	566
Ningxia	1982	0	72	665	66
Xinjiang	6706	639	405	2569	298
Qinghai	1146	0	132	3	155
East:					
Zhejiang	16788	75	456	688	885
Jiangsu	29889	557	1141	161	1633
Shanghai	2416	16	200	18	232
Anhui	17815	271	971	88	1003
Central:					
Hubei	22441	491	1063	335	1479
Hunan	26820	149	843	1596	1994
Jiangxi	16257	109	622	2299	1138
South:					
Guangdong	18526	0	572	23711	1622
Guangxi	13410	1	241	19907	1015
Fujian	8897	0	156	3854	689
Hainan	1777	0	47	4030	133
Southwest:					
Sichuan	43307	146	1756	2732	4334
Guizhou	8855	1	618	229	782
Yunnan	10930	1	172	8213	813
Xizang	580	0	18	0	91
Sum of above	435293	5673	16384	84188	27236
Total	435293	5675	16383	84187	27238

Source: 1992 China Statistics Abstract.

Appendix table 3--China's oilseeds and cotton area, yield, and production, 1987-91

Item	1987	1988	1989	1990	1991 <sup>1</sup>
<b>Sown area:</b> 1,000 hectares					
Cotton	4,844	5,535	5,203	5,588	6,538
Oilseeds, USDA <sup>2</sup>	22,431	21,434	21,929	21,163	22,256
Soybeans	8,411	8,120	8,057	7,560	7,041
Oilseeds, PRC <sup>3</sup>	11,181	10,619	10,512	10,900	11,530
Peanuts	3,022	2,914	2,946	2,907	2,880
Rapeseed	5,267	4,936	4,993	5,503	6,133
Sesameseed	869	704	722	669	680
Sunflowerseed	887	830	716	713	750
Other oilseeds <sup>4</sup>	1,136	1,135	1,140	1,108	1,087
<b>Yield:</b> Kg/hectare					
Cotton	877	750	731	805	868
Oilseeds, USDA <sup>2</sup>	1,370	1,235	1,200	1,528	1,487
Cottonseed	1,490	1,274	1,240	1,369	1,476
Soybeans	1,482	1,434	1,270	1,346	1,379
Oilseeds, PRC <sup>3</sup>	1,366	1,243	1,220	1,391	1,421
Peanuts	2,042	1,954	1,793	2,196	2,189
Rapeseed	1,254	1,021	1,090	1,265	1,212
Sesameseed	605	574	592	670	640
Sunflowerseed	1,399	1,420	1,486	1,714	1,467
Other oilseeds <sup>4</sup>	647	781	605	901	1,020
<b>Production:</b> 1,000 tons					
Cotton <sup>5</sup>	4,246	4,149	3,788	4,508	5,675
Cotton (1,000 bales) <sup>5</sup>	19,500	19,100	18,000	20,705	26,065
Oilseeds, USDA <sup>2</sup>	33,698	30,615	28,450	32,331	33,088
Cottonseed	7,217	7,053	6,440	7,664	9,648
Soybeans	12,465	11,645	10,230	11,000	9,710
Oilseeds, PRC <sup>3</sup>	15,278	13,203	12,820	16,132	16,383
Peanuts	6,170	5,693	5,360	6,368	6,303
Rapeseed	6,605	5,040	5,440	6,958	7,436
Sesameseed	526	404	340	469	435
Sunflowerseeds	1,241	1,180	1,064	1,339	1,100
Other oilseeds <sup>4</sup>	735	886	690	998	1,109
Edible veg oil <sup>6</sup>	4,870	5,012	5,393	5,415	6,392
Available meal <sup>6</sup>	8,618	7,147	7,317	9,000	9,907

<sup>1</sup> Figures for sunflowerseed and other oilseeds are USDA estimates.

<sup>2</sup> Oilseed data published by USDA include only soybeans, cottonseed, peanuts, rapeseed, and sunflowerseed; area includes cotton.

<sup>3</sup> China's total oilseed data exclude soybeans and cottonseed.

<sup>4</sup> "Other oilseeds" are calculated as a residual and include mainly hemp (an edible oil-bearing flaxseed) and castor beans; oil-bearing tree seeds are excluded.

<sup>5</sup> Cotton production is on a ginned-weight basis. Bales are 480 pounds.

<sup>6</sup> Available oil and meal are estimated by USDA for the marketing year following harvest by applying assumed crush and extraction rates to production plus net imports. Edible vegetable oil excludes linseed oil.

Sources: China Statistical Yearbook, 1988-91; China Agriculture Yearbook, 1988-91; and China Statistics Abstract, 1992.

Appendix table 4--China's yearend livestock inventory and product output, 1987-91

Item	1987	1988	1989	1990	1991
Million head					
Yearend inventory:					
Hogs	327.73	342.22	352.81	362.41	369.65
Large animals	121.91	125.38	128.05	130.21	131.93
Draft animals	71.13	72.19	74.32	76.06	76.82
Cattle	94.65	97.95	100.75	102.88	104.59
Dairy cows	2.16	2.22	2.53	2.69	na
Water buffalo	21.50	21.65	21.40	21.69	na
Horses	10.69	10.54	10.29	10.17	10.09
Mules	10.84	11.05	11.14	5.49	5.61
Donkeys	5.25	5.37	5.39	11.20	11.16
Camels	0.48	0.47	0.47	0.46	0.44
Sheep	102.65	110.57	113.51	112.82	110.86
Goats	77.69	90.96	98.13	97.21	95.36
Poultry	2,050.00	2,150.00	2,275.00	na	na
Million head					
Number slaughtered:					
Hogs	261.77	275.70	290.23	309.91	328.97
Cattle	6.33	8.58	9.43	10.88	na
Sheep & goats	56.52	68.27	81.22	89.31	na
Percent					
Slaughter rate:					
Hogs	77.6	84.1	84.8	87.8	90.8
Cattle	6.9	9.1	9.4	10.2	na
Sheep & goats	34.0	37.9	38.4	43.3	na
1,000 tons					
Production:					
Meat	19,860	21,936	23,262	25,135	27,238
Pork	18,349	20,176	21,228	22,811	24,523
Beef	792	958	1,072	1,256	1,535
Mutton	719	802	962	1,068	1,180
Poultry meat	2,020	2,744	2,820	3,229	na
Cow's milk	3,301	3,660	3,813	4,157	4,644
Sheep & goat's milk	487	529	570	594	na
Sheep's wool	209	222	237	239	na
Mohair	13	14	16	17	na
Cashmere	4	5	5	6	na
Eggs	5,902	6,955	7,198	7,946	9,220

na = not available

Sources: China Agriculture Yearbook, 1988-91; and 1992 China Statistics Abstract.

Appendix table 5--China's major agricultural exports, by volume, 1988-91

Item	Units	1988	1989	1990	1991
Swine, live	1,000 head	3,027	2,980	3,000	2,850
Poultry, live	1,000 head	44,180	44,840	47,840	47,520
Beef, fresh or frozen	Tons	53,986	56,493	96,593	132,040
Pork, fresh or frozen	Tons	63,484	88,423	124,236	116,635
Broiler, frozen	Tons	25,660	31,465	37,813	45,395
Rabbit meat, frozen	Tons	20,976	21,438	20,545	11,742
Eggs	Million	924	753	601	605
Food grain	1,000 tons	7,180	6,570	5,830	10,860
Rice	1,000 tons	700	320	330	690
Corn (maize)	1,000 tons	3,920	3,500	3,400	7,780
Soybeans	1,000 tons	1,480	1,260	940	1,110
Fruit	Tons	280,853	272,557	226,387	163,563
Oranges	Tons	74,705	70,514	65,624	43,414
Apples	Tons	87,859	70,331	62,425	24,082
Walnuts, in shell	Tons	8,370	8,684	5,247	4,992
Walnut meat	Tons	10,608	12,845	8,712	8,245
Chestnuts	Tons	35,292	33,296	36,022	33,939
Sugar	Tons	247,802	429,623	570,493	343,315
Natural honey	Tons	46,487	71,498	88,005	69,958
Tea	Tons	198,290	204,583	195,471	184,872
Canned food	Tons	554,176	548,355	565,748	657,660
Pork	Tons	81,528	86,341	90,906	128,409
Vegetables	Tons	333,224	332,143	332,708	340,265
Fruit	Tons	87,967	71,399	77,825	99,102
Beer	Tons	39,343	41,753	35,223	43,634
Flue-cured tobacco	Tons	19,367	21,931	27,511	60,937
Goatskin	1,000 pieces	1,145	7,890	9,140	2,410
Furskin, raw	1,000 pieces	435	3,800	4,660	1,620
Mink skin	1,000 pieces	174	2,660	2,720	850
Raw silk	Tons	9,404	12,819	7,604	7,919
Cotton	Tons	468,002	272,482	167,282	199,980
Cashmere	Tons	2,712	2,039	1,413	2,020
Rabbit hair	Tons	9,735	6,442	4,703	6,419
Oilseeds, edible	Tons	510,215	392,080	515,523	572,231
Peanuts and shelled peanuts	Tons	251,218	266,066	387,322	427,640
Vegetable oil	Tons	25,503	62,099	139,477	99,334
Cotton yarn	Tons	205,717	183,656	176,156	187,035

na = not available

Source: China's Customs Statistics, 1988-91

Appendix table 6--China's major agricultural exports, by value, 1988-91

Item	1988	1989	1990	1991
U.S. \$1,000				
Swine, live	232,910	242,410	270,090	276,350
Poultry, live	76,540	76,940	84,530	82,040
Beef, fresh or frozen	107,980	105,940	158,740	203,850
Pork, fresh or frozen	115,820	159,300	215,480	185,660
Broilers, frozen	43,480	55,320	74,390	95,840
Rabbit meat, frozen	37,390	34,610	30,080	26,110
Eggs	41,130	40,070	28,610	27,820
Food grain	1,189,060	1,191,630	1,019,130	1,581,440
Rice	180,980	94,470	84,130	151,830
Corn (maize)	393,480	438,810	403,560	864,470
Soybeans	380,970	365,610	228,300	262,210
Fruit	125,710	135,365	102,880	78,700
Oranges	38,300	34,610	31,080	22,600
Apples	39,410	27,100	25,590	9,790
Walnuts, in shell	8,260	8,650	5,440	4,970
Walnut meat	23,510	27,160	18,500	19,280
Chestnuts	61,420	53,950	62,220	63,100
Sugar	62,040	161,400	229,910	120,650
Natural honey	37,020	56,140	71,710	61,390
Tea	401,970	420,790	412,710	376,060
Canned food	649,160	674,260	681,410	787,900
Pork	143,480	147,540	152,880	193,470
Vegetable	353,090	366,540	361,320	364,160
Fruit	58,730	51,710	53,250	76,670
Beer	20,640	25,180	19,570	25,920
Flue-cured tobacco	41,480	47,660	49,360	118,040
Goatskin	42,330	31,500	34,080	8,370
Furskin, raw	51,600	39,120	29,670	15,400
Mink skin	37,920	33,990	24,150	11,050
Raw silk	308,680	575,090	362,120	336,580
Cotton	718,850	431,150	300,540	360,960
Cashmere	190,610	194,540	141,740	163,860
Rabbit hair	230,390	137,320	96,800	105,220
Oilseeds, edible	260,260	248,460	352,200	448,470
Peanuts and shelled				
Peanuts	170,220	189,960	271,120	360,270
Vegetable oil	17,370	39,460	95,420	76,520
Cotton yarn	511,770	424,210	390,200	459,850

na = not available

Source: China's Customs Statistics, 1988-91.

Appendix table 7--China's major agricultural imports, by volume, 1988-91

Item	Units	1988	1989	1990	1991
Food grain	1,000 tons	15,330	16,580	13,720	13,450
Wheat	1,000 tons	14,550	14,880	12,530	12,370
Barley	1,000 tons	80	245,580	na	na
Rice	1,000 tons	na	1,200	60	140
Corn (maize)	1,000 tons	110	70	370	--
Dried beans	1,000 tons	30	40	30	20
Soybeans	1,000 tons	150	0	0	--
Sugar	Tons	3,708,940	1,580,635	1,132,122	1,013,763
Coffee & coffee extracts	Tons	2,849	6,174	987	1,933
Cocoa beans	Tons	16,777	23,980	10,074	30,262
Natural rubber	Tons	362,150	410,668	355,414	306,161
Synthetic rubber	Tons	40,974	47,044	44,487	84,252
Logs	1,000 tons	na	na	na	na
	1,000 cubic meters	9,320	6,050	4,150	3,970
Cotton	Tons	34,773	519,039	416,733	370,524
Jute & hemp	Tons	750	0	0	0
Wool	Tons	187,377	101,368	33,329	106,243
Animal oil & fats	Tons	119,839	98,201	93,483	80,012
Edible vegetable oil	Tons	213,721	1,056,156	1,122,832	611,887
Other vegetable oil	Tons	480,135	781,940	1,189,692	1,091,734
Oilseeds					
(other than soybeans)	Tons	1,443	0	0	0
Fertilizer, manufactured	Tons	14,706,323	13,933,013	16,275,945	18,175,189
Ammonia sulphate	Tons	78,507	0	0	na
Urea	Tons	8,492,246	7,940,709	8,146,840	7,005,128
Superphosphates	Tons	na	141,816	133,853	202,542
Potassium chloride	Tons	na	1,118,247	2,072,805	2,432,214
Compound fertilizer	Tons	na	964,647	4,629,397	7,033,791
Agricultural agent					
(chemicals)	Tons	34,142	36,591	28,487	na

na = not available.

Source: China's Customs Statistics, 1988-91.

Appendix table 8--China's major agricultural imports, by value, 1988-91

Item	1988	1989	1990	1991
U.S. \$1,000				
Food grain	1,895,540	2,990,700	2,352,850	1,642,740
Wheat	1,731,040	2,581,200	2,156,530	1,459,540
Barley	8,640	44,150	na	na
Rice	na	304,030	11,600	39,840
Corn (maize)	12,060	9,270	47,580	130
Dried beans	11,980	16,480	8,720	6,750
Soybeans	37,080	280	320	260
Sugar	858,240	429,780	378,880	256,270
Coffee/coffee extracts	17,550	17,970	63,200	6,770
Cocoa beans	34,880	35,500	11,900	34,840
Natural rubber	429,040	376,480	285,530	261,240
Synthetic rubber	59,190	54,690	66,860	127,970
Logs	na	na	na	na
	899,760	601,860	460,560	454,310
Cotton	58,850	708,700	710,790	630,650
Jute & hemp	320	na	na	0
Wool	895,540	516,870	146,060	350,480
Animal oil & fats	50,370	39,930	37,660	29,150
Edible vegetable oils	94,820	498,310	528,270	289,090
Other vegetable oils	228,360	341,120	419,040	401,140
Oilseeds				
(other than soybeans)	700	na	na	na
Fertilizer (mnfctd)	2,335,490	2,363,650	2,605,100	3,229,490
Ammonia sulphate	6,920	na	na	na
Urea	1,218,150	1,169,800	1,156,090	1,216,430
Superphosphates	na	24,010	22,980	32,860
Potassium chloride	na	138,230	243,100	294,242
Compound fertilizer	na	215,200	964,860	148,187
Agricultural agent (chemicals)	156,270	196,200	177,140	na

na = not available

Source: China's Customs Statistics, 1988-91

Appendix table 9--U.S. agricultural exports to China, 1989-91<sup>1</sup>

Item	Fiscal years			Calendar years		
	1989	1990	1991	1989	1990	1991
1,000 tons						
Wheat	8,332	3,825	3,650	7,401	3,692	4,373
Corn	0	442	0	302	140	0
Tobacco	437	133	0	0	133	0
Cattle hides, whole <sup>2</sup>	189	37	112	133	29	159
Soybeans	0	0	0	0	0	0
Cotton	186	191	209	196	183	227
Soybean oil	0	0	1	0	0	1
US \$ 1,000						
Wheat	1,225,371	544,030	330,192	1,108,656	497,348	363,339
Corn	0	48,560	0	33,527	15,033	0
Tobacco	2,491	938	0	0	938	0
Cattle hides, whole	7,791	1,831	4,954	5,410	1,245	7,196
Soybeans	0	0	0	0	0	0
Cotton	233,981	289,742	300,581	259,144	277,213	318,794
Soybean oil	0	0	851	0	0	852
Others	26,489	23,899	31,421	26,371	22,236	32,277
US \$ million						
Total agricultural	1,496	909	668	1,435	814	722
Total nonagricultural	na	4,015	5,006	4,320	3,993	5,565
Total	na	4,924	5,674	5,755	4,807	6,287

na = not available.

<sup>1</sup> U.S. domestic exports, f.a.s.-value basis. Exports include transshipments of agricultural products through Canada.<sup>2</sup> Numbers in thousands.

Source: U.S. Bureau of the Census, "U.S. Agricultural Exports," country by commodity, monthly printouts; U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, various issues.

Appendix table 10--China's average \$U.S. exchange rate, 1980-91

	1980	1981	1982	1983	1984	1985
RMB/\$US						
Average rate	1.4984	1.7045	1.9757	1.9757	2.3200	2.9367
	1986	1987	1988	1989	1990	1991
Average rate	3.4528	3.7221	3.7221	3.7651	4.7832	5.3234

Source: IMF International Financial Statistics, various issues.

Appendix table 11--Major U.S. agricultural imports from China, by calendar year, 1987-91<sup>1</sup>

Item	1987	1988	1989	1990	1991
US \$ 1,000					
Meats and products, excluding poultry	1,300	380	272	137	239
Other meats, fresh or frozen	1,280	355	155	137	237
Poultry and products	35,513	31,729	40,408	39,383	43,691
Eggs	1,206	1,112	1,091	1,886	241
Feathers and down, crude	34,303	30,607	39,287	37,457	43,385
Hides and skins	909	3,625	74	770	695
Furskins	780	1,960	18	387	351
Wool, unmanufactured, apparel grades	3,615	4,621	3,511	1,497	1,017
Sausage casings	2,391	6,280	10,371	4,713	6,845
Silk, raw	4,259	4,744	11,097	7,455	5,420
All other animal products	23,658	20,987	18,085	12,692	11,075
Grains and feeds	4,987	5,079	8,057	6,995	8,751
Fruits and preparations	7,415	10,186	8,158	6,881	14,239
Fruits, prepared or preserved	7,410	10,169	8,021	6,802	14,122
Nuts and preparations	7,352	6,777	10,930	7,718	7,176
Vegetables and preparations	68,800	83,366	97,942	60,294	85,936
Vegetables, prepared or preserved	67,043	81,377	93,643	52,206	75,295
Mushrooms, canned	41,446	48,522	58,941	10,674	24,554
Waterchestnuts	16,393	17,082	15,267	15,168	17,327
Sugar and related products	6,298	6,166	9,575	10,584	19,011
Spices	7,902	6,048	7,159	4,960	2,660
Beverages	35,749	44,658	6,996	6,964	7,437
Coffee and products	404	153	135	94	26
Cocoa and products	6,286	13,994	8,578	11,572	13,492
Tea	14,215	20,169	21,699	23,385	25,837
Malt beverages	6,895	8,821	5,241	6,150	6,588
Oilseeds and products	4,172	6,884	3,976	3,217	3,054
Oilseeds and oilnuts	1,004	1,268	1,950	1,802	1,643
Oils and waxes, vegetable	3,168	4,112	1,997	1,407	1,380
Seeds, field and garden	2,974	3,525	6,733	9,968	14,722
Essential oils	13,754	19,321	13,924	16,782	18,095
Drugs, crude natural	7,343	8,522	10,133	15,083	11,559
All other vegetable products	9,218	10,967	4,964	5,217	5,327
Total agricultural commodities	237,463	279,531	319,233	270,620	327,930
Total nonagricultural commodities	5,957,837	8,231,369	11,669,032	14,966,672	18,647,870
Total imports	6,195,300	8,510,900	11,988,500	15,237,300	18,975,800

na = not available.

<sup>1</sup> Imports for consumption, customs-value basis.

Source: U.S. Department of Commerce, Bureau of the Census, "U.S. Agricultural Imports," country by commodity, annual printouts; U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, various issues.

Appendix table 12--China's calendar year grain trade, by country, 1986-90

Item	1986	1987	1988	1989	1990
1,000 tons					
Net grain trade	50	11,028	10,268	10,350	8,833
Total exports	7,442	5,206	5,094	6,209	4,850
Total imports	7,492	16,234	15,362	16,559	13,683
Wheat imports	6,114	13,200	14,550	14,880	12,527
Argentina	534	810	304	1,049	858
Australia	2,616	4,432	397	1,677	1,386
Canada	2,538	5,699	7,532	1,761	4,136
EC	145	566	30	1,594	2,143
United States	226	1,564	5,768	8,293	3,919
Flour imports	167	461	102	144	80
Argentina	0	0	0	0	0
Australia	2	45	0	1	0
Canada	75	167	33	17	0
EC	0	99	na	26	0
United States	1	1	3	4	1
Japan	85	112	57	84	60
Rice imports <sup>1</sup>	322	541	310	1,201	56
Australia	0	0	0	0	0
Burma	72	92	20	40	0
Korea, DPR	20	26	37	66	43
Thailand	230	316	253	1,002	5
United States	0	0	0	0	0
Coarse grain imports	787	1,752	190	314	1,020
Argentina	30	143	0	0	0
Australia	42	95	30	176	585
Canada	157	94	52	70	07
EC	0	0	0	0	0
Thailand	509	169	0	1	0
United States	32	1,239	107	54	356
Corn imports	588	1,541	109	68	368
Argentina	30	143	0	0	0
Australia	0	0	0	0	0
Canada	0	0	0	0	0
EC	0	0	0	0	0
Thailand	509	169	0	1	0
United States	32	1,228	107	54	356
Barley imports	199	211	81	246	652
Australia	42	95	30	176	585
Canada	157	94	52	70	67
EC	0	0	0	0	0
United States	1	11	0	0	0

continued--

Appendix table 12--China's calendar year grain trade, by country, 1986-90  
--continued

Item	1986	1987	1988	1989	1990
1,000 tons					
Total grain exports	7,442	5,206	5,094	6,209	4,850
Rice exports	950	1,022	698	314	325
Hong Kong	0	54	106	62	43
Iran	124	175	0	0	0
Macau	0	47	11	5	4
Sri Lanka	11	11	92	61	0
United Arab Emirates	82	10	6	5	9
Democratic Yemen	12	7	31	0	15
Benin	22	0	2	0	0
Angola	0	17	0	0	0
Guinea	21	0	19	15	0
Ivory Coast	81	109	0	0	0
Libya	41	31	20	20	0
Mauritius	50	51	54	47	42
France	11	0	0	0	0
Bulgaria	10	21	0	8	10
Czechoslovakia	41	41	30	20	30
German, DR	30	24	20	10	5
Poland	60	75	60	15	0
Romania	30	50	21	10	31
Switzerland	0	32	24	0	0
Brazil	70	0	0	0	0
Cuba	100	101	50	10	25
Peru	49	93	0	0	0
Indonesia	na	na	na	na	46
Coarse grain exports	6,492	4,184	4,396	4,515	4,525
Corn exports	5,640	3,916	3,912	3,502	3,404
Korea, DPR	127	89	165	296	246
Hong Kong	761	218	238	116	60
Japan	2,709	1,600	1,504	1,289	918
Malaysia	0	20	144	182	112
Philippines	177	61	0	32	36
Singapore	16	42	172	127	59
German, FR	0	15	0	0	0
German, DR	85	21	98	83	0
Poland	104	104	0	0	0
USSR	1,603	1,720	1,447	1,183	na
Mexico	41	24	0	0	0
Republic of Korea	na	na	na	na	931
Other grain exports: <sup>2</sup>	852	268	484	1,013	1,121

na = not available.

<sup>1</sup> Only imports of semi-milled or milled rice.

<sup>2</sup> Includes millet, sorghum, buckwheat, good bean, red bean, many bean, kidney bean, and other beans.

Source: China's Customs Statistics, 1986-90.

Appendix table 13--China's calendar year trade in other agricultural commodities, by country, 1986-90

Item	1986	1987	1988	1989	1990
Tons					
Imports:					
Cotton	186	5,976	34,773	519,039	416,733
Pakistan	0	1,948	20,166	144,342	29,084
Egypt	0	3,822	1,986	1,284	1,319
Sudan	0	200	5,113	34,147	41,445
United States	0	1	940	227,908	210,175
Sugar	1,114,232	1,760,277	3,351,393	1,580,635	1,132,122
Australia	423,101	408,682	425,750	196,411	142,464
Cuba	392,779	396,415	1,350,261	794,097	868,406
Thailand	242,700	678,375	799,242	322,418	74,409
United States	0	177,164	0	451	574
Philippines	0	15,900	0	23	0
Exports:					
Cotton	558,089	754,576	468,002	272,483	167,282
Hong Kong	157,822	189,551	61,353	24,823	2,279
Indonesia	51,607	57,311	42,740	17,677	16,573
Japan	103,171	183,194	142,7894	63,324	47,308
USSR	43,714	43,862	7,322	29,579	25,216
Thailand	17,747	36,434	14,381	17,336	11,635
Soybeans	1,368,205	1,710,141	1,477,324	1,247,648	940,340
Hong Kong	9,108	16,107	39,425	16,503	11,511
Indonesia	260,413	273,785	308,252	162,405	278,693
Japan	343,410	296,833	299,484	297,732	278,227
Malaysia	150,308	126,446	120,799	125,252	54,164
Singapore	19,916	31,731	57,393	17,090	4,706
USSR	448,506	816,343	509,762	499,967	221,199

Source: China's Customs Statistics, 1986-90

Appendix table 14--China's other agricultural output, 1988-91

	1988	1989	1990	1991
1,000 tons				
Sugar crops	61,875	58,038	72,145	84,187
Sugarcane	49,064	48,795	57,620	67,898
Sugarbeets	12,810	9,243	14,525	16,289
Tobacco	2,734	2,830	2,627	na
Flue-cured	2,337	2,405	2,259	2,670
Tea	545	535	540	542
Jute and hemp <sup>1</sup>	1,078	660	726	513
Silk cocoons	394	435	480	584
Aquatic products	10,610	11,520	12,370	13,350
Rubber	240	243	264	296
Fruit	16,661	18,319	18,744	21,761

na = not available

<sup>1</sup> Starting in 1989, hemp figures are on a processed basis (conversion is 2kg raw equals 1kg processed).

Sources: 1991 Statistical Yearbook and 1992 China Statistics Abstract.

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